Vol. 1041 Number 3

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

April 17, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

April 17, 1984 Volume 1041 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced at 1039 O.G. 142 on Feb. 21, 1984.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Prior corresponding U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Commissioner of Patents and Trademarks.

Jan. 30, 1984.

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,270,004, Re. S.N. 575,323, Filed Jan. 31, 1984, Cl. 568/314, CHEMICAL PROCESS FOR THE PREPARATION OF 4(6-METHOXY-2-NAPHTHYL)BUTAN-2-ONE, Carl John Rose, et al., Owner of Record: *Beecham Group Ltd., Brentford, Middlesex, England,* Attorney or Agent: Albert L. Jacobs, et al., Ex. Gp.: 126

4,302,014, Re. S.N. 574,695, Filed Nov. 21, 1983, Cl. 273/182.3, GOLF TRAINING DEVICE, Michael S. Shull, Owner of Record: *Speshull Products, Inc., Evansville, Ind.,* Attorney or Agent: Warren D. Flackbert, Ex. Gp.: 334

4,313,785, Re. S.N. 575,931, Filed Jan. 31, 1984, Cl. 159/6W, METHOD AND APPARATUS FOR TREATING WASTE ROCK CUTTINGS, Herman J. Schellstede, Owner of Record: *Inventor,* Attorney or Agent: Thomas B. Van Poole, et al., Ex. Gp.: 177

4,315,965, Re. S.N. 567,809, Filed Jan. 3, 1984, Cl. 428/198, METHOD OF MAKING NONWOVEN FABRIC AND PRODUCT MADE THEREBY HAVING BOTH STICK BONDS AND MOLTEN BONDS, Charles R. Mason, et al., Owner of Record: *Scott Paper Co., Philadelphia, Pa.,* Attorney or Agent: Joseph H. Yamaoka, Ex. Gp.: 164

4,374,319, Re. S.N. 561,512, Filed Dec. 14, 1983, Cl. 219/400, COUNTER-TOP OVEN, Paul Guibert, Owner of Record: *Sunset Ltd., Los Angeles, Calif.,* Attorney or Agent: Michael Ebert, Ex. Gp.: 231

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,121,159, Reexam. No. 90/000,499, Requested: Feb. 10, 1984, Cl. 364/900, CENTRAL OFFICE MASSIVE MEMORY RECORDING SYSTEM, Edward Rogal, Owner of Record: *Valutron, N. V., Southport, Conn.,* Attorney or Agent: Frank F. Scheck, Ex. Gp.: 230, Requester: IBM Corp., Research Triangle Park, N.C.

3,778,626, Reexam. No. 90/000,528, Requested: Mar. 19, 1984, Cl. 250/492.1, MECHANICAL SCAN SYSTEM FOR ION IMPLANTATION, Gordon Ian Robertson, Owner of Record: *Requester,* Attorney or Agent: Douglas J. Kirk, Ex. Gp.: 256, Requester: AT & T Technologies, Inc., New York, N.Y.

3,875,017, Reexam. No. 90/000,525, Requested: Mar. 8, 1984, Cl. 202/174, MULTI-STAGE THIN FILM EVAPORATOR HAVING A HELICAL VAPOR FLOW PATH, Risto V. J. Saari, et al., Owner of Record: *Oy Finn-Aqua Ltd., Helsinki, Finland,* Attorney or Agent: Martin G. Raskin, Ex. Gp.: 170, Requester: Owner

3,888,815, Reexam. No. 90/000,521, Requested: Mar. 2, 1984, Cl. 524/703, SELF-BONDING TWO-PACKAGE ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS, Stanley J. Bessmer, et al., Owner of Record: *General Electric Co., Waterford, N.Y.,* Attorney or Agent: Gary Loser, Ex. Gp.: 140, Requester: Owner

4,161,004, Reexam. No. 90/000,530, Requested: Mar. 19, 1984, Cl. 360/106, HEAD POSITIONING MECHANISM FOR RECORD/PLAYBACK MACHINE, Warren L. Dalziel, Owner of Record: *Shugart Associates, Sunnyvale, Calif.,* Attorney or Agent: Ronald Zibelli, Ex. Gp.: 235, Requester: Shugart Corp., c/o Xerox Corp., Rochester, N.Y.

4,352,045, Reexam. No. 90/000,523, Requested: Mar. 8, 1984, Cl. 315/291, ENERGY CONSERVATION SYSTEM USING CURRENT CONTROL, Don F. Widmayer, Owner of Record: *Flexiwatt Corp., Rockville, Md.,* Attorney or Agent: Larson & Taylor, Ex. Gp.: 250, Requester: Jack M. Wiseman, San Jose, Calif.

Service by Publication

A petition to cancel the registration listed below having been filed, and the notice of such proceeding sent by registered mail to registrant at the last known address having been returned by the Postal Service as undeliverble, notice is hereby given that unless the regis-

trant listed herein, its assign or legal representative, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Meridian Engineering, Inc., Philadelphia, Pa., Reg. No. 891,081, for the Mark MERIDIAN, Canc. No. 13,874.

ERMA S. BROWN,
Deputy Clerk,
Trademark Trial and
Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before May 1, 1984.

Abers, Julia E., 2450 Walters Way, #4, Concord, Calif. 94520
Aufrichtig, Peter D., 209 Garth Rd., #3M, Scarsdale, N.Y. 10583
Bak, Mary E., 815 Judson Ave., Evanston, Ill. 60202
Brogan, Marilyn, Post Office Rd., S. Salem, N.Y. 10590
Brown, Randall C., 4441 S. 34th St., Arlington, Va. 22205
Conger, William G., 41251 Appleby Ct., Northville, Mich. 48167
Connors, William J., 22 Quinn Cir., Madison, Wis. 53713
Hampilos, Gus T., P.O. Box 472, Florham Park, N.J. 07932-0472
Hawkins, Jackson T., 2032 Dundee Rd., Rockville, Md. 20850
Hovell, William P., 12 Fort Hill Cir., Staten Island, N.Y. 10301
Kadlubowski, Marian F., 334 Meade Terr., Union, N.J. 07083
Lewis, Linda L., 6 Maplewood Dr., Wilbraham, Mass. 01095
Long, Joseph F., 8912 Laurel Grove, Austin, Tex. 78758
Mirabel, Eric-Paul, 1330 Grayburn Rd., Pasadena, Calif. 91107
Patterson, Joanne W., 5505 Limeric Cir., #14, Wilmington, Del. 19808
Pismenny, Boris M., 25 E. Ruby Ave., Palisades Park, N.J. 07650
Shedd, Wayne L., 7825 Lee Ave., Alexandria, Va. 22308
Shudy, John G., Jr., 2016 Coral Sea Cir., Ridgecrest, Calif. 93555
Stagg, William W., 110 Valencia Dr., Lafayette, La. 70516
Welch, James D., 10328 Pinehurst, Omaha, Nebr. 48124

WILLIAM FELDMAN
Mar. 20, 1984. *Director, Office of*
Enrollment and Discipline.

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverge for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Government Inventions and Patents
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Patent Licensing,
Office of Governmental Inventions and Patents
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-352,661 (4,431,039). INVOLUTED DISC SLICER.
SN 6-566,380. ALKALINE PEROXIDE TREATMENT OF NONWOODY LIGNOCELLULOSICS.
SN 6-566,469. SESBANIMIDE AND THE USE THEREOF IN TREATING LEUKEMIC TUMORS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-249,229 (4,431,742). RADIORECEPTOR ASSAY FOR BENZODIAZEPINES IN SALIVA.

DEPARTMENT OF THE AIR FORCE

SN 6-306,843 (4,414,670). E-BEAM MAINTAINED PLASMA DISCHARGE ELECTRODES.
SN 6-324,348 (4,418,127). BATTERY CELL MODULE.
SN 6-324,349 (4,415,993). FAST ACCESS NON-VOLATILE MEMORY.
SN 6-324,913 (4,415,132). AIRCRAFT HAVING VARIABLE INCIDENCE FORWARD-SWEPT WING.
SN 6-399,661 (4,417,039). CIS-ENYNE AROMATIC AND AROMATIC HETEROCYCLIC POLYMERS.
SN 6-434,648. TECHNIQUE FOR THE GROWTH OF COMPOSITIONALLY UNGRADED SINGLE CRYSTALS OF SOLID SOLUTIONS.
SN 6-478,589. PENTAFLUOROTELLURIUM OXIDE FLUOROCARBONS.
SN 6-562,263. IMPROVED FLAMEHOLDER WITH REMOVABLE FLAMEHOLDER ATTACHMENTS.
SN 6-564,547. HEAT RESISTANT SHEATHED INSULATED ELECTRICAL CONDUCTORS.
SN 6-564,548. SEAL PART SUPPORTED ON ROTOR DISC LUG.
SN 6-566,351. ELECTROLUMINESCENT (EL) REMOTELY-CONTROLLED LANDING ZONE MARKER LIGHT SYSTEM.
SN 6-566,352. VARIABLE RADIUS LEAD FORMER.
SN 6-566,444. APPARATUS FOR ETCHING VERTICAL JUNCTION SOLAR CELL WAFERS.
SN 6-566,445. FUEL PUMP VENT DRAIN SYSTEM.
SN 6-566,753. MULTIPLE JET BLOWING AROUND THE BLUNT TRAILING EDGE OF A CIRCULATION CONTROLLED AIRFOIL.

DEPARTMENT OF THE ARMY

SN 6-020,145 (4,225,224). PROCESS AND APPARATUS FOR LASER ILLUMINATION OF PRINTING PLATES.
SN 6-090,809 (4,262,381). AMPHIBIOUS VEHICLE BRIDGE APPARATUS.
SN 6-124,873 (4,347,410). MICROPHONE DROOP AND SENSITIVITY MEASUREMENT DEVICE.
SN 6-132,592 (4,304,120). AUTOMATIC GAS MEASUREMENT AND ANALYSIS FOR A TEST CELL.
SN 6-152,441 (4,360,799). HYBRID OPTICAL-DIGI-

TAL PATTERN RECOGNITION APPARATUS AND METHOD.
SN 6-164,490 (4,397,126). ENVIRONMENTALLY ADAPTABLE ROOF STRUCTURE.
SN 6-181,495 (4,422,181). BI-DIRECTIONAL FIBRE-OPTIC COUPLER.
SN 6-183,878 (4,301,208). METHOD FOR REDUCING THE ADHESION OF ICE TO THE WALLS OF NAVIGATION LOCKS.
SN 6-193,495 (4,002,708). METHOD FOR PRODUCING POLYMER IMPREGNATED FOAMED MASONARY ELEMENTS.
SN 6-195,821 (4,326,420). KERF PRESSURE PLATE MATERIAL TESTER.
SN 6-198,977 (4,346,602). APPARATUS AND METHOD FOR MEASURING ADHESIVE BOND STRENGTH.
SN 6-217,335 (4,397,548). DISTANCE MEASURING SYSTEM.
SN 6-248,934 (4,346,612). LIQUID SAMPLER.
SN 6-255,184 (4,352,322). PREFABRICATED VEHICLE MAINTENANCE APPARATUS.
SN 6-265,886. APPARATUS FOR DETERMINING BREAK LOCATIONS IN FENCING.
SN 6-274,602 (4,398,787). OPTICAL LEVERAGE TELECENTRIC SCANNING APPARATUS.
SN 6-285,889. METHOD FOR DISPERSING OR ARRESTING LAVA FLOW.
SN 6-315,551 (4,379,050). GRANULAR FLUID BIOFILTER REVERSING.
SN 6-318,500. A MICROWAVE SYSTEM FOR PARTICLE AND SHOCK VELOCITY MEASUREMENT IN A GEOLOGICAL TYPE MATERIAL.
SN 6-322,306. RETICLE PLATE AND METHOD FOR ESTABLISHMENT OF A NORTH-ORIENTED OR SOUTH-ORIENTED LINE BY CIRCUMPOLAR ORIENTATION.
SN 6-328,765 (4,425,654). ULTRAVIOLET PREIONIZER FOR HIGH POWER LASER.
SN 6-479,631 ELECTRONIC MONITORING SYSTEM.
SN 6-496,700. MEASUREMENT TECHNIQUES OF ELECTRICAL PARAMETERS OF SURFACE MATERIALS IN THE X-BAND REGION.
SN 6-828,796 (4,110,912). TRIAXIAL DEFLECTION METER.
SN 6-895,881 (4,167,260). BRACKET MEANS FOR MOUNTING TEST FIXTURES ON BOILER TUBES.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 17, 1984

PP. 5,163	4,391,554	4,412,442	4,420,857
Re. 30,979	4,392,187	4,412,735	4,421,082
Re. 31,270	4,394,580	4,413,136	4,421,172
D. 270,981	4,395,089	4,413,172	4,421,501
D. 271,960	4,395,799	4,414,855	4,421,645
D. 272,518	4,396,638	4,415,677	4,421,737
3,577,971	4,397,809	4,415,678	4,421,866
4,237,180	4,398,943	4,415,892	4,421,931
4,253,155	4,399,025	4,417,180	4,422,160
4,309,435	4,399,112	4,417,269	4,422,336
4,313,149	4,399,569	4,417,299	4,422,422
4,319,295	4,399,972	4,417,329	4,423,275
4,321,058	4,401,487	4,417,398	4,423,727
4,333,500	4,401,756	4,417,664	4,424,040
4,345,103	4,402,237	4,418,166	4,424,544
4,345,543	4,403,184	4,418,188	4,424,757
4,353,679	4,403,317	4,418,357	4,425,107
4,354,313	4,403,400	4,419,006	4,425,286
4,354,898	4,404,387	4,419,037	4,425,446
4,354,917	4,404,390	4,419,130	4,425,492
4,363,876	4,404,848	4,419,145	4,425,513
4,372,568	4,405,418	4,419,407	4,425,581
4,374,984	4,405,621	4,419,567	4,425,831
4,377,695	4,407,505	4,419,777	4,426,153
4,377,820	4,408,037	4,419,820	4,427,063
4,378,685	4,408,245	4,420,194	4,427,349
4,380,328	4,409,036	4,420,221	4,428,859
4,382,812	4,409,842	4,420,324	4,429,349
4,384,414	4,411,002	4,420,326	4,429,795
4,385,636	4,411,504	4,420,433	4,429,853
4,386,421	4,411,525	4,420,508	
4,390,791	4,411,595	4,420,611	

Disclaimers

3,447,978.—*Harold F. Bluhm,* Tamaqua, Pa. AMMONIUM NITRATE EMULSION BLASTING AGENT AND METHOD OF PREPARING SAME. Patent dated June 3, 1969. Disclaimer filed Jan. 27, 1984, by the assignee, *Atlas Powder Co.*

Hereby enters this disclaimer to claims 18 through 30 of said patent.

3,821,906.—*Winfred M. Berg,* E. Rockaway, N.Y. TRANSMISSION BELT. Patent dated July 2, 1974. Disclaimer filed Feb. 23, 1984, by the assignee, *Winfred M. Berg, Inc.*

The term of this patent subsequent to July 31, 1990 has been disclaimed.

3,980,956.—*Kenneth R. Woolling, Jr.,* Indianapolis, Ind. COUNTER TYPE REMOTE CONTROL RECEIVER INCLUDING NOISE IMMUNITY SYSTEM. Patent dated Sept. 14, 1976. Disclaimer filed Feb. 21, 1984, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 1 through 5 of said patent.

4,028,520.—*Sumner H. Torrey,* West Lafayette, Ind. AIR FLOW SYSTEM FOR COMMON CAVITY MICROWAVE OVEN. Patent dated June 7, 1977. Disclaimer filed Feb. 13, 1984, by the assignee, *Roper Corp.*

Hereby enters this disclaimer to claim 1 of said patent.

4,107,125.—*Elwyn R. Lovejoy,* Hockessin, Del. CROSSLINKED AROMATIC POLYIMIDES AND ARTICLES MADE THEREFROM. Patent dated Aug. 15, 1978. Disclaimer filed Feb. 17, 1984, by the assignee, *E. I. Du Pont De Nemours and Co.*

Hereby enters this disclaimer to claims 7 and 8 of said patent.

4,256,945.—*Philip S. Carter,* Palo Alto and *John F. Krumme,* Woodside, Calif. ALTERNATING CURRENT ELECTRICALLY RESISTIVE HEATING ELEMENT HAVING INTRINSIC TEMPERATURE CONTROL. Patent dated Mar. 17, 1981. Disclaimer filed Jan. 16, 1984, by the assignee, *Oximetrix, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4, 5, 9 and 11 of said patent.

4,272,830.—*Jerry D. Moench,* Austin, Tex. ROM STORAGE LOCATING HAVING MORE THAN TWO STATES. Patent dated June 9, 1981. Disclaimer filed Feb. 13, 1984, by the assignee, *Motorola, Inc.*

Hereby enters this disclaimer to claims 4, 5, and 6 of said patent.

4,302,295.—*Masayuki Shimada,* Tokyo, Japan. NUCLEAR FUEL ELEMENT. Patent dated Nov. 24, 1981. Disclaimer filed Feb. 28, 1984, by the assignee, *Tokyo Shibaura Denki Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1–6 of said patent.

4,312,707.—*Tatsuo Miyazawa,* Chiba, Japan. NUCLEAR FUEL ROD. Patent dated Jan. 26, 1982. Disclaimer filed Feb. 29, 1984, by the assignee, *Tokyo Shibaura Denki Kabushiki Kaisha.*

Hereby enters this disclaimer to claims 1–8 of said patent.

Disclaimer and Dedication

3,509,833.—*Richard L. Cook,* Phoenix, Ariz. HARD FACED CERAMIC AND PLASTIC ARMOR. Patent dated May 5, 1970. Disclaimer and Dedication filed Oct. 14, 1983, by the assignee, *Goodyear Aerospace Corp.*

Hereby disclaims and dedicates to the Public the term of the patent subsequent to Aug. 8, 1983.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF March 17, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action

CHEMICAL EXAMINING GROUPS

GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director 10-28-82
Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.

GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director 5-12-76
Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.

HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director 1-06-83
Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.

COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director 7-26-82
Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.

SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—
R. F. WHITE, Director 1-16-76
Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.

ELECTRICAL EXAMINING GROUPS

INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director 3-22-82
Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.

SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director 6-01-81
Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.

INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director 7-06-81
Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.

RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—
G. M. FORLENZA, Director 7-19-82
Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.

ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director 1-26-81
Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.

DESIGN, GROUP 290—KENNETH L. CAGE, Director 1-14-71
Industrial Arts; Household, Personal and Fine Arts.

MECHANICAL EXAMINING GROUPS

HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director 3-16-82
Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.

MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director 8-03-82
Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.

AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—
R. E. AEGERTER, Director 11-04-76
Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.

HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director 11-20-81
Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.

GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—
A. L. SMITH, Director 7-23-81
Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.

Expiration of patents: The patents within the range of numbers indicated below expire during March 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,307,200 to 3,311,920, inclusive
Plant Patents ..... Numbers 2,723 to 2,729 inclusive

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

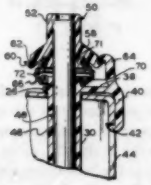
Re. 31,553
PIVOT AND GUIDE ROD ASSEMBLY FOR BI-FOLD DOOR

Ralph E. Ford, Harper Woods, and Kim W. Wright, Roseville, both of Mich., assignors to Slimfold Manufacturing Company, Inc., Dothan, Ala.

Original No. 3,810,274, dated May 14, 1974, Ser. No. 382,486, Jul. 25, 1973. Application for reissue Jul. 25, 1980, Ser. No. 172,255

Int. Cl.³ E05D *5/12*

U.S. Cl. 16—380 **4 Claims**



1. In a metal door assembly:
a door panel comprising a face sheet,
a stiffening channel secured to one surface of said sheet along an edge thereof, said channel having a pair of spaced apart flanges extending outwardly from said surface and a connecting web,
a pivot rod assembly mounted in said channel,
said assembly comprising an elongated plastic sleeve extending through corresponding openings in said flanges,
a collar on said sleeve,
sleeve retaining means operatively arranged between said sleeve and said channel to retain said sleeve in said channel,
a pivot rod having a shank portion positioned in said sleeve and slidable therein and an enlarged head portion,
a compression spring operatively arranged between said channel and said head portion for urging said head portion away from said channel,
and releasable latch means operatively arranged between said head portion and said sleeve for releasably retaining said head in a retracted position adjacent said collar.

Re. 31,554
ROLL DEVICE

Sture Giege, Spanga, and Torgny C. B. Lagerqvist, Enskede, both of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

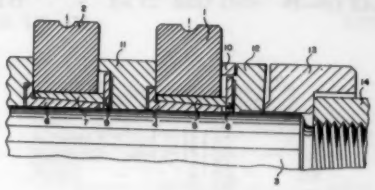
Original No. 4,208,147, dated Jun. 17, 1980, Ser. No. 888,615, Mar. 21, 1978. Application for reissue Jun. 21, 1981, Ser. No. 226,696

Claims priority, application Sweden, Mar. 21, 1977, 7703169

Int. Cl.³ B60B *9/00*

U.S. Cl. 29—117 **17 Claims**

1. A roll device comprising:
a roll shaft,
at least one roll ring mounted on the roll shaft,
a lock member securable to the roll shaft,
centering means interposed radially between the roll ring and the roll shaft to radially center the roll ring,
a first resilient spring element arranged to resiliently transmit axial forces from said lock means to said centering means to radially center said roll ring,
a second resilient spring element arranged to resiliently transmit axial forces from said lock means to said roll ring to axially clamp the latter, *the axial forces transmitted to*



said roll ring being greater than the axial forces transmitted to said centering means.

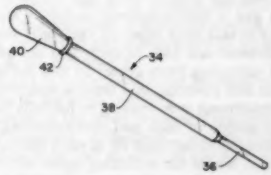
Re. 31,555
PIPETTE

Ralph F. Garren, Canoga Park, and B. Sarver, Burbank, both of Calif., assignors to Beral Enterprises, Inc., Arleta, Calif.

Original No. 3,834,241, dated Sep. 10, 1974, Ser. No. 355,714, Apr. 30, 1973. Application for reissue Mar. 2, 1976, Ser. No. 663,069

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.11 **2 Claims**



1. A single piece pipette formed in an integral manner of plastic material, said pipette comprising:
a drawing tube section adapted to draw fluid from a vessel;
a container portion connected to said drawing tube, said drawing tube having an opening therethrough communicating with an enlarged interior chamber located within said container portion, both said container portion and said drawing tube being [formed] substantially rigid;
a bulbous *imperforate* portion connected to the free end of said container portion, said bulbous portion being readily felxible so that it is capable of being squeezed to apply an air pressure force or a vacuum within said chamber of said container portion;
[the wall thickness of said container portion being approximately one-half the wall thickness of said drawing tube, the wall thickness of said bulbous portion being approximately one-half the wall thickness of said container portion;] *the wall thickness of said container being less than the wall thickness of said drawing tube and greater than the wall thickness of said bulbous portion* and
means interconnecting said bulbous portion and said container portion for preventing local collapse of said container portion during squeezing of said bulbous portion.

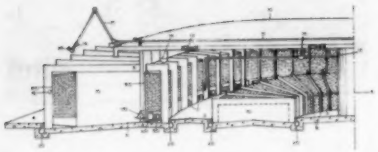
Re. 31,556
KENNEL, CIRCULAR FACILITY

Robert R. Buchanan, 340 Rosewood Ave., San Jose, Calif. 95117

Original No. 3,991,717, dated Nov. 16, 1976, Ser. No. 632,841, Dec. 4, 1975. Continuation of Ser. No. 961,274, Nov. 16, 1978, abandoned. Application for reissue Aug. 15, 1980, Ser. No. 178,306

Int. Cl.³ A01K *1/02*

U.S. Cl. 119—19 **13 Claims**



1. A circular kennel building having a floor, at least one annular ring of wedge-shaped kennel compartments located on said floor within a perimeter of said kennel buildings, each said compartment having two solid side walls *with at least one of said walls being shared with an adjacent compartment*, an innermost end gate and an outermost end gate, each said compartment being [bisected into an outboard run and a feeding watering section by a bisecting wall extending between two sidewalls, swinging door means located in said bisecting wall, automatic swinging door latch means to control opening of said swinging door means, access swinging door means located in said bisecting wall, animal feeder means located in said wedge-shaped compartment,] *covered by a ceiling of perforated material, each of said two solid sidewalls extending substantially above said ceiling and past said innermost and said outermost gates;* servicing corridor means located annularly in said kennel building, each said compartment having one end [wall] *gate* in contact with said corridor *and a bisecting wall extending between said two side walls dividing said compartment into an outboard run and a feeding-watering section,* [annular gutter means located in said floor adjacent said inner most end wall and said outermost end gate of each said compartment,] a circular roof extending from center of said building toward said perimeter and covering said feeding-watering section of each said compartment and covering or partially covering said outboard run section of each said compartment[, means for providing uncontaminated fresh air to each said compartment, decontamination means for sterilizing egress air leaving each said compartment, exhaust fan means located in said roof, automatic compartment cleaner means comprising radially movable hose means extending from center of said roof toward said perimeter of said building, controllable valve means on said hose means to permit control of ejectioon of wash fluid from said hose means, drive means for selectively moving said hose means successively from compartment to compartment in turn, means for motivating an animal to move from one section of each said compartment to the other section of each said compartment and control means located in said building for programming and controlling all above said means].

Re. 31,557
ELECTRICAL SWITCHES

David Aspden, Burnley, England, assignor to Lucas Industries Limited, Birmingham, England

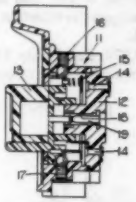
Original No. 4,245,141, dated Jan. 13, 1981, Ser. No. 63,400, Aug. 3, 1979. Application for reissue May 7, 1981, Ser. No. 261,456

Claims priority, application United Kingdom, Aug. 11, 1978, 33070/78

Int. Cl.³ H01H *19/14*

U.S. Cl. 200—314 **7 Claims**

1. An electrical switch comprising a body including a base, an operating member supported by the body for rotational and axial movement relative thereto, an aperture extending through the base and a light source support member received in said aperture, said support member and the wall of the aperture being so shaped that the support member can be located in the base in either of first and second different axial positions relative to the base, and the support member including a blocking element, which in the first axial location of the



support member relative to the base, extends into the path of either axial or rotational movement of the operating member relative to the body to prevent such movement of the operating member relative to the body, the second location of the support member relative to the base being such that said blocking element lies out of the path of either axial or rotational movement of the operating member so that both movements of the operating member relative to the body are permitted.

Re. 31,558
FLAT CATHODE RAY TUBE WITH REPELLER ELECTRODE AND OPTICAL MAGNIFYING MEANS

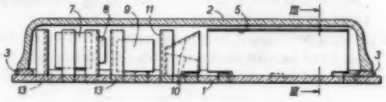
Clive M. Sinclair, 18 Newton Rd., Cambridge, Cambridgeshire, and Anthony V. Krause, London Rd., St. Ives, Huntingdon, Cambridgeshire PE17 4HJ, both of England

Original No. 4,205,252, dated May 27, 1980, Ser. No. 906,062, May 15, 1978. Application for reissue Oct. 13, 1981, Ser. No. 311,155

Claims priority, application United Kingdom, May 18, 1977, 20962/77

Int. Cl.³ H01J *29/72, 29/80, 29/90*

U.S. Cl. 313—422 **13 Claims**



1. A cathode ray tube, comprising

(a) an evacuated envelope including a plurality of sections (1,2) at least one of which (1) is planar and formed of a transparent material;

(b) a generally planar fluorescent screen (5) arranged in said envelope opposite, parallel with and spaced from said one transparent envelope section;

(c) an electron gun (7) arranged within said envelope in laterally spaced relation to said screen for projecting an electron beam between said screen and said one transparent envelope section along a path generally parallel with the plane of said screen;

(d) first deflecting means (10) arranged in said envelope for causing the electron beam to scan a line;

(e) second deflecting means (9) arranged in said envelope for causing the electron beam to scan a frame including a plurality of lines, thereby to produce an image on the screen; [and]

(f) beam directing means compensating for the increase of the angle of incidence of the beam at the screen relative to

the direction of the electron beam, said beam directing means comprising a single electrically conductive repeller electrode (12) mounted in said envelope opposite said screen;

(g) one of said first and second deflecting means being arranged to deflect the electron beam through an angle less than the angle required to produce on the screen an image of the same dimensions as the desired dimensions of the display, thereby to produce an image one dimension of which is less than the desired corresponding dimension of the display;

(h) and further including optical means (6) for magnifying the image to produce a display of the desired dimensions.

Re. 31,559

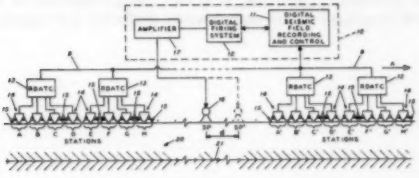
COMBINATION FLYER-JUMPER ASSOCIATED WITH A GEOPHYSICAL DATA ACQUISITION SYSTEM AND METHOD OF MANUFACTURE

Reid F. Carter, Houston, Tex., assignor to Chevron Research Company, San Francisco, Calif.

Original No. 4,146,872, dated Mar. 27, 1979, Ser. No. 819,317, Jul. 27, 1977. Continuation of Ser. No. 700,689, Jun. 28, 1976. Application for reissue Jan. 19, 1981, Ser. No. 225,930

Int. Cl.³ G01V *1/22*; H01R *25/00*

U.S. Cl. 367—76 **14 Claims**



12. A geophone flyer-jumper for use in conjunction with a remote digital acquisition and telemetering circuit (RDATC) equipped to receive several channels of information simultaneously, comprising:

a central geophone cable segment including a plurality of conductors and a multiplicity of interconnected geophones therein connected to certain of said plurality of conductors; and

a series of N/2 hermaphroditic connectors connected to said plurality of conductors each of said hermaphroditic connectors having an outer housing but matched at the opposite end to a like identification coded and similarly electrically connected connector, whereby at least one paired, like coded set of connector pins is electrically connected to said geophones and at least another pair of like coded set of connector pins is electrically connected to certain other of said plurality of conductors but electrically isolated from said geophones.

Re. 31,560

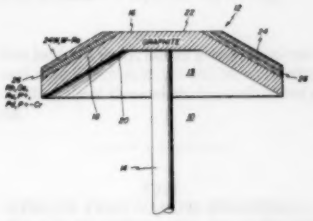
GRAPHITE DISC ASSEMBLY FOR A ROTATING X-RAY ANODE TUBE

Thomas M. Devine, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Original No. 4,119,879, dated Oct. 10, 1978, Ser. No. 788,130, Apr. 18, 1977. Application for reissue Apr. 5, 1982, Ser. No. 365,078

Int. Cl.³ H01J *35/08*

U.S. Cl. 378—125 **8 Claims**



1. A disc for an anode assembly for a rotating x-ray anode tube comprising

a graphite substrate having two opposed major surfaces which are, respectively, the inner and outer surface of [the] *said* substrate [and] *with each major surface having* an inner portion and an integral outer portion;

an anode target affixed to a predetermined surface area of [the] *said* integral outer portion of [the] *said* substrate wherein the material of [the] *said* anode target is one selected from the group consisting of tungsten and a tungsten-rhenium alloy;

[a layer of metal joining the anode target to the predetermined surface area of the outer surface of the integral outer portion of the substrate wherein the material of the layer of metal is one within which carbon is not soluble in the temperature range of from about 1000° C. to about 1300° C. but may have a solubility therein of from 1 to 4 atomic percent at the temperature of joining the anode target to the substrate;]

[the material of the layer of metal has some solubility in the material of the anode target;]

[the material of the layer of metal is one selected from the group consisting of rhodium, osmium, ruthenium, platinum, palladium and an alloy of platinum and chromium; and

the] *a metallic layer extending between and joining said anode target and said predetermined surface area; said metallic layer consisting of a barrier metal lamina flanked on opposite sides by first and second brazed regions; the metal constituting said barrier metal lamina providing an effective barrier against carbon diffusion and being selected from the group consisting of rhodium, osmium, ruthenium, palladium, platinum and an alloy of platinum and chromium; said first and second brazed regions consisting of alloys formed with the metal selected for said barrier metal lamina; said first brazed region, in which the metal selected for said barrier metal lamina was reacted with carbon, extending between one side of said barrier metal lamina and said predetermined surface area adjacent thereto; and said metallic* layer has a thickness of at least ½ mil.

PLANT PATENTS

GRANTED APRIL 17, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,219

ROSE PLANT CV. AROART

Herbert C. Swim, and Jack E. Christensen, both of Ontario, Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Aug. 31, 1982, Ser. No. 413,454

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—21 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, being particularly characterized in its extremely large foliage; its very velvety texture on the inside of each petal; its uniform red coloration throughout the flower life; its slow opening; and its abundant production of long-stemmed flowers.

5,220

PEAR TREE ("AUTUMN RED")

Robert E. Fowler, Newcastle, Calif., assignor to Fowler Nurseries, Inc., Newcastle, Calif.

Filed Nov. 8, 1982, Ser. No. 440,168

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of pear tree, substantially as illustrated and described, characterized by the bearing of late ripening fruit having a waxy, highly glossy, deep red to purple-red skin, and which fruit is in harvest for approximately one month, extending about three weeks beyond the last picking of the Rosired.

5,221

GINKGO TREE NAMED SHANGRI-LA

Willet N. Wandell, Myra Station Rd., Rte. 3, Box 158, Urbana, Ill. 61801

Filed Mar. 18, 1981, Ser. No. 245,154

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of *Ginkgo biloba,* substantially as herein shown and described, characterized by its rapid, compact growth habit growing 55 feet in height with a 40 foot branch spread in 17 years, dense full crown caused by in addition to the basic scaffold, the supplementary or secondary branches occurring throughout the center of the crown giving the tree crown a heavy, full appearance, straight trunk, ease of propagation and freedom from production of foul smelling fruit.

PATENTS

GRANTED APR. 17, 1984

ERRATA

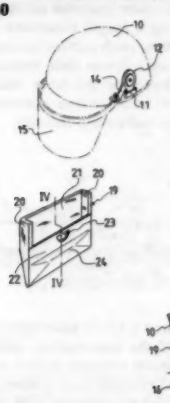
For CLASS	See PATENT NO.
411–552	4,442,572
384–428	4,443,044
156–064	4,443,494

PATENTS

GRANTED APRIL 17, 1984

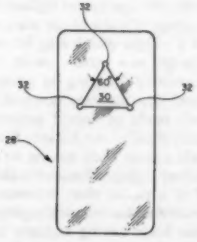
GENERAL AND MECHANICAL

4,442,551
ADAPTER FOR A PROTECTIVE HELMET
Arne Hellberg, Gråbo, Sweden, assignor to Hellberg Protection AB, Lerum, Sweden
Filed Dec. 22, 1982, Ser. No. 452,034
Int. Cl.³ A42B *1/06, 3/00*
U.S. Cl. 2—10 **5 Claims**



1. An adapter for removable attachment to an arm of a fitting for mounting the fitting in a pocket at the margin of a protective helmet, said fitting arm having a sidewardly directed projection extending from a resilient tongue, said adapter comprising a sleeve-shaped member having two at least partly tapering end walls, and front and rear walls interconnecting said end walls, said rear wall extending from the wider end of said tapering end walls to approximately midway thereof, said front wall extending from the narrower ends of said tapering end walls to about midway thereof, and said front wall having an opening for the reception of the projection of said fitting.

4,442,552
BIB
Martha E. Bolick; Rebecca J. Weber, both of Winnebago County, and Theodore B. Lang, Outagamie County, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.
Filed Jan. 16, 1981, Ser. No. 225,616
Int. Cl.³ A41B *13/00*
U.S. Cl. 2—49 R **11 Claims**



1. In a bib formed from a flexible material and having a size consistent with its intended use and means defining an opening for placing the bib over the wearer,

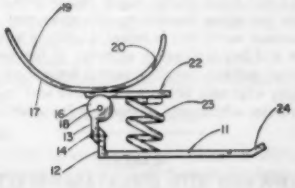
the improvement wherein said defined opening comprises a triangular shape having three corners and a base line side of the triangle 30% to 95% of the total bib width and in a position to be generally parallel to the shoulders of the wearer in use and the other two sides of the triangle meet forming an angle opposite the longest side in the range of about 30° to 120°.

4,442,553
INTRAOCULAR LENS
Philip C. Hessburg, 801 Park La., Grosse Pointe Park, Mich. 48230
Filed Sep. 17, 1981, Ser. No. 303,084
Int. Cl.³ A61F *1/16, 1/24*
U.S. Cl. 3—13 **3 Claims**

1. In an intraocular lens having a plastic lens body with a pair of opposed haptic supports of strand material extending radially outward substantially in the plane of the lens body, the improvement comprising:

each haptic support is divided into a horizontal portion for contacting the periphery of the space in the eye where placed and a resiliently flexible strut portion connecting the lens body to said horizontal portion, said strut portion comprising a pair of strands disposed on radius lines passing through the optical center of the lens body and subtending an angle of from 2° to 10°.

4,442,554
BIOMECHANICAL ANKLE DEVICE
Arthur Copes, P.O. Box 42, French Settlement, La. 70733
Filed Feb. 12, 1982, Ser. No. 348,284
Int. Cl.³ A61F *11/04*
U.S. Cl. 3—35 **3 Claims**



1. Biomechanical ankle prosthesis means comprising:

(a) a substantially flat main base plate means adapted for connection to an artifical foot; having a perpendicularly extending portion integrally connected to one end of said main base plate means, said perpendicularly extending portion being bored to receive a pin means disposed in a parallel relationship to a longitudinal axis of said main base plate means;

(b) a vertically extended connector hinge means having its lower portion pivotally connected to said perpendicularly extending portion of said main base plate means through said pin means so as to pivot relative thereto about the longitudinal axis of said main base plate means, thus imitating a rotation in subtalar joint of an ankle, said connector hinge means being further defined as comprising a hinged portion having a longitudinal axis transverse to that of said main base plate means;

(c) leg attachment assembly having an upper portion adapted for connection to an artificial leg means and rigidly attached lower portion comprising a spring base connector member being provided with a hinged portion connected to an upper portion of said connector hinge means to form a clevis joint and to allow said leg attachment assembly to move in a vertical plane relative to said main base plate means, so as to imitate rotation at an ankle axis; and

(d) spring coil means interposed between said leg attachment assembly and said main base plate means.

4,442,555

TOILET BOWL ODOR REMOVAL SUCTION CONTROL

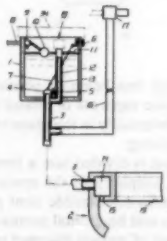
Yoshitaka Aoyama, 20-11 Makitsukadai 2-chome, Sakai-shi, Osaka 590-01, Japan

Filed Jun. 3, 1981, Ser. No. 269,973

Claims priority, application Japan, Jul. 6, 1980, 55-76812

Int. Cl.³ E03D 9/05

U.S. Cl. 4—213 **3 Claims**



1. A toilet bowl odor removal suction control device for use with a water closet having a flush passageway leading from a flush tank to a toilet bowl, an overflow pipe in said flush tank extending above the water line and in communication with said flush passageway,

said device being characterized in that an exhaust passageway is connected to said flush passageway, a suction fan is installed in said exhaust passageway, and a ventilation control means is installed in an opening of said overflow pipe, said ventilation control means comprising an annular valve seat fitted on the upper end of said overflow pipe and a ball valve seatable on said valve seat,

said annular valve seat is turnable relative to said overflow pipe and has a plurality of holes in the peripheral wall thereof, and said overflow pipe is formed with holes cooperating with said holes in said valve seat to form ventilation holes whose area of opening is variable.

4,442,556

SOFA BED WITH INFLATABLE MATTRESS

William A. Craigie, 3602 W. 40th St., Minneapolis, Minn. 55410

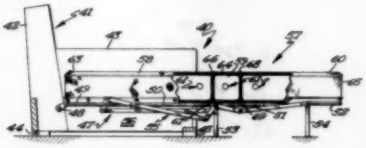
Filed Mar. 1, 1983, Ser. No. 470,925

Int. Cl.³ A47C 17/04, 27/10

U.S. Cl. 5—13 **3 Claims**

1. A foldable, inflatable sectional mattress and a sofa bed of the type including a fixed frame having a pair of upright side frame members, an upright back frame member extending between and secured to the side frame members, a front board extending between and secured to the side frame members, a foldable sectional sofa frame including inner, intermediate and outer frame sections pivotally connected together for movement between a folded, collapsed position within the fixed frame and an extended, horizontal position extending outwardly from the fixed frame, said foldable sectional mattress comprising:

an air inflated inner mattress section, an air inflated intermediate mattress section, and an air inflated outer mattress section, said inner mattress section having a length dimension greater than the combined length dimensions of said intermediate and said outer mattress sections, said outer mattress section having a length dimension greater than said intermediate section, each section having a cover, an upper slide fastener and a lower slide fastener releasably interconnecting the cover of the inner mattress section with the cover of the intermediate mattress section to dispose the sections in end-to-end relation,



an upper slide fastener and a lower slide fastener releasably securing the cover of the intermediate mattress section with the cover of the outer mattress section to dispose said sections in end-to-end relation, said mattress being foldable to a collapsed position when one of said slide fasteners between said inner section and said intermediate section is unfastened, whereby the other slide fastener between the inner mattress section and the intermediate mattress section functions as a hinge to permit swinging movement between the inner section relative to the intermediate and outer sections to a folded position, said inner section overlying said intermediate and outer sections when in the folded position and defining a seat for the fixed frame of the sofa bed, said intermediate section when in the folded position being positioned rearwardly of the outer section and below the rear end portion of the inner section, said sectional mattress being folded and unfolded independently of the folding and unfolding of the foldable sofa frame.

4,442,557

CARRIER APPARATUS FOR FIRE FIGHTERS

Robert M. Clemens, 3700 Sellman Rd., Beltsville, Md. 20705

Continuation of Ser. No. 147,211, May 6, 1980, abandoned. This application Feb. 4, 1982, Ser. No. 345,674

Int. Cl.³ A61G 1/00; B65D 75/00

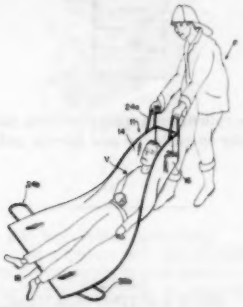
U.S. Cl. 5—82 R **5 Claims**

1. Carrier apparatus for use by fire fighters for carrying hose to a fire site as a package of a size to contain a substantial length of fire hose and of a weight which may be carried by a single fire fighter, and for use as a person carrier to support supine adult victim for rescue by dragging by a single fire fighter or for lifting by plural fire fighters, comprising, an elongate, flaccid carrier body made of flaccid material, and having a length approximately equal to the distance from the head to the calf of an adult, said carrier body having an elongate bottom, a single end wall and a pair of spaced side wall means for cradling the head of a victim there between, said single end wall being at an end of and substantially perpendicular to said bottom, said carrier body having an open end opposite said single end wall, said side wall means extending from said single end wall, and being subtantially perpendicular to said end wall at their junctions therewith, said side wall means extending from said end wall in the same direction as said bottom, and being spaced apart approximately the width of a head at said end wall, sid side wall means each having a longitudinally

extending edge remote from said bottom, and extending to said bottom, handle means on each of said side wall means for lifting said carrier body and a load supported thereby, and comprising:

(a) first handle means adjacent said end wall for lifting the head and upper body portion of the victim on said carrier body and for causing said side wall means to cradle the head of a victim therebetween, and

(b) second handle means remote from said first handle means for lifting the lower body of a victim on said carrier body, and



strap means extending from one side wall means to the other side wall means across the edge thereof, and releasable securing means for said strap means,

whereby a fire hose may be placed in said carrier body with an end of the fire hose placed adjacent the open end of said carrier body for ready withdrawal from said carrier body, and whereby an adult victim may be dragged or carried on said carrier body, with the victim's head adjacent said end wall, supported on said bottom, and cradled between said side wall means.

4,442,558

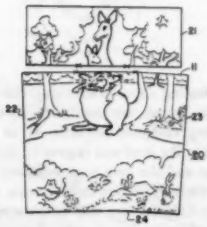
BED COVERING HAVING AN OVERALL PATTERN AND A POCKET INTEGRATED THEREIN

Carolyn Alexander, 173 Highland Pl., Monrovia, Calif. 91016

Filed Dec. 8, 1980, Ser. No. 214,339

Int. Cl.³ A47G *9/02*

U.S. Cl. 5—494 **4 Claims**



1. A bed covering for use on an infant or child's bed comprising:

a body of fabric material dimensioned to cover at least the top surface of a bed;

said body having imprinted thereon a pattern depicting a scene;

a pocket in said body having an opening therein extending generally transverse to the length of the covering over a part of the width of the cover;

said pocket being expandable by outward extension of the body of fabric material upward and outward from the remaining surface of the body;

wherein said pattern in the region below the opening of the pocket is expanded and the material defining the pocket is of greater fullness than the bed covering above the pocket opening whereby the pattern appears relatively undistorted whether the pocket is occupied or not.

4,442,559

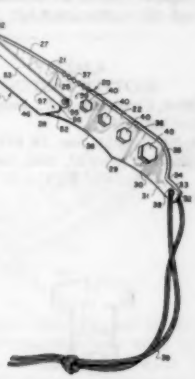
UTILITY KNIFE

Walter W. Collins, Rock Hill, S.C., assignor to Jenkins Metal Corporation, Gastonia, N.C.

Filed Jul. 2, 1981, Ser. No. 279,789

Int. Cl.³ B26B *11/00*

U.S. Cl. 7—158 **10 Claims**



1. A utility knife comprising a fixed knife blade having a sharpened edge and a tool-shaped shank, said blade and shank extending in axial alignment with each other and formed as an integral unit, positioning links on each side of the shank and a first pivot pin extending transversely through the medial portion of the shank and pivotally connecting the positioning links to the shank, a channel-shaped housing having a free end and pivotally connected at its other end by a second pivot pin to the ends of the links opposite the first pivot pin, means supporting the housing in a first position about one edge of the shank, and means supporting the housing in a second position about the sharpened edge of the blade.

4,442,560

METHOD FOR CONTINUOUSLY FINISHING AND/OR DYEING PLANAR TEXTILE STRUCTURES

Kurt van Wersch, Wegberg, and Manfred Pabst, Cologne, both of Fed. Rep. of Germany, assignors to A. Monforts, Monchen-Gladbach, Fed. Rep. of Germany

Filed Sep. 30, 1980, Ser. No. 192,303

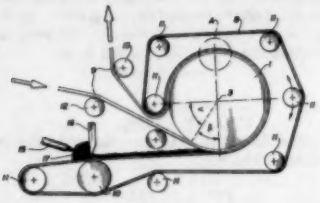
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1979, 2939796

Int. Cl.³ D06B *5/08*

U.S. Cl. 8—151 **2 Claims**

1. Method of continuously treating a planar textile structure by applying thereto a treatment medium in the form of foam which comprises applying the foam medium to a continuous air-impermeable surface and sandwiching the applied foam medium thereafter between the continuous air-impermeable surface and a surface of the planar textile structure, subsequently applying underpressure to the opposite surface of the planar textile structure at a magnitude at which the foam is completely destroyed without any appreciable flow through the material of the planar textile structure, the underpressure being applied to the planar textile structure by passing the

latter through a chamber maintained at the underpressure, the magnitude of the underpressure being low when compared to the internal pressure of the bubbles of the foam so that the bubbles are completely destroyed without appreciable flow of the foam through the textile structure.



4,442,561

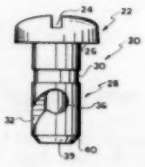
SLOTTED FASTENER

Conrad J. Gunther, Uniondale, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Division of Ser. No. 964,451, Nov. 29, 1978, Pat. No. 4,250,600. This application Mar. 17, 1980, Ser. No. 130,981

Int. Cl.³ B23C *3/00*

U.S. Cl. 10—1 R **3 Claims**



1. A method of forming a fastener adapted to be coupled and uncoupled with a receptable having a cam follower thereon to form a fastener assembly comprising; providing the fastener with an enlarged head portion and a reduced diameter shank portion extending from the head portion and terminating in a distal end, cutting a spiral cam slot in the shank by milling the slot in the surface of the shank along a substantially continuously radius of curvature from the entrance point at the distal end of the shank to a termination point spaced from the distal end in order to form a slot of predetermined width, length, and a depth less than the cross section of the shank in order to form a base and two opposing side walls of the slot, thereafter, widening the entrance end of the slot by back milling one side wall along a predetermined portion of the slot adjacent the entrance point to relieve the surface of the slot forming the wall at an angle to the radius of curvature of the slot and outward therefrom so that coupling and uncoupling of the cam slot with a cam follower will be facilitated.

4,442,562

METHOD OF FORMING ANCHOR BOLTS

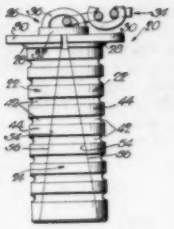
Peter J. Russo, 719 Nut Plains Rd., Guilford, Conn. 06437

Filed May 7, 1982, Ser. No. 375,804

Int. Cl.³ B21K *1/74*

U.S. Cl. 10—27 R **5 Claims**

1. The method of making an anchor bolt with outer prongs and an inner expander, which comprises lengthwise cutting a cylindrical metal blank with an axis in first planes which subtend different parts of the blank periphery and are inclined inwardly to one end of the blank at identical wedge angles to said axis to thereby separate the blank into different prongs and an expander with a narrow end, with said prongs and expander having plane companion wedge faces, respectively, and said prongs having cylindrical gripping surfaces, and then securing to said expander an anchor at said narrow end.



4,442,563

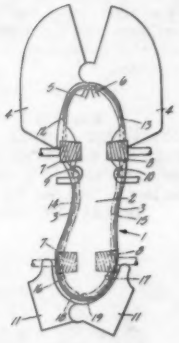
SHOE LASTING MACHINE

Gerhard Lauckhardt, Rodelheim; Rudi Fichtner, Rosbach, and Manfred Bröning, Ffm-Sossenheim, all of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Division of Ser. No. 144,331, Apr. 28, 1980, Pat. No. 4,319,373. This application Feb. 24, 1982, Ser. No. 351,667

Int. Cl.³ A43D *21/00*

U.S. Cl. 12—145 **3 Claims**



1. Method of lasting shoes comprising the steps of applying adhesive between lasting marginal portions of the shoe upper and corresponding marginal portions of an insole along the side portions and in the heel seat region of the shoe, and lasting said side portions and the heel seat, wherein the side portions are lasted progressively, using lasting rolls starting from the ball region of the shoe bottom and terminating at the heel seat region thereof, adhesive being applied progressively, in advance of the lasting rolls, along the side portions of the shoe, and the heel seat is lasted using wiper plates which overlap the area previously lasted by the lasting rolls, and further wherein, when the lasting of the side portions is completed, the lasting rolls are maintained in contact with the shoe bottom, and thus pressure is applied thereby to the shoe bottom, at the point of termination of the side lasting, while adhesive continues to be applied progressively in the heel seat region, whereafter the applied pressure is removed by retraction of the lasting rolls and the heel seat region is lasted.

4,442,564

GOLF BALL CLEANER

William J. Berry, 498 Franklin La., Elk Grove Village, Ill. 60007

Filed Sep. 30, 1982, Ser. No. 429,841
Int. Cl.³ A63B 47/04
U.S. Cl. 15—21 A 15 Claims

1. A portable golf ball cleaner comprising:

a container having a bottom wall and sidewalls defining a cleaning liquid receptacle portion and a movable cover portion cooperatively defining an internal, sealed ball cleaning space;

fixed bristles projecting inwardly from at least one of said container portions to define an inner ball receiving space at the inner distal ends thereof;

a carrier rotatably, sealingly mounted to said container to define a portion of a sidewall thereof and having bristles projecting inwardly to said ball receiving space to generally horizontally engage a ball supported therein on said fixed bristles; and

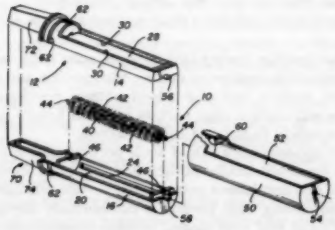
means for rotating said carrier portion of the sidewall to cause random rotative movement of a golf ball received in said ball receiving space for cleaning of the ball surface by the distal ends of the bristles, said sealed container portions preventing discharge of cleaning liquid from the container in a closed arrangement thereof.

4,442,565

PORTABLE POCKET CLOTHES BRUSH

Clarence D. Zierhut, Richardson, Tex., assignor to Clarence Zierhut Incorporated, Richardson, Tex.

Filed Sep. 2, 1982, Ser. No. 414,351
Int. Cl.³ A46B 13/08
U.S. Cl. 15—27 8 Claims



1. A brush comprising:

a housing having an aperture;

bristle means mounted within said housing and extending through said aperture;

said housing further having an elongated slot to facilitate emptying of said housing of debris collected by said bristle means;

cover means including an aperture, said cover means being mounted to said housing, said housing being selectively rotatable within said cover means to a first position exposing said bristle means through said aperture of said cover means for use of the brush and said housing being rotatable to a second position for covering said housing aperture and said bristle means when the brush is not in use; and

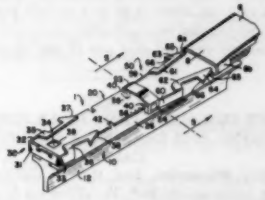
means for preventing said housing from rotating to prevent said elongated slot from aligning with said aperture of said cover means.

4,442,566

WINDSHIELD WIPER BLADE REFILL UNIT

Bernard C. Sharp, White Plains, N.Y., assignor to Parker-Hannifin Corporation, Shelton, Conn.

Filed Nov. 6, 1981, Ser. No. 318,840
Int. Cl.³ B60S 1/02, 1/38
U.S. Cl. 15—250.42 10 Claims



1. A windshield wiper blade refill unit for use in any one of a plurality of pressure-applying wiper blade holders each of which comprises sets of claws spaced apart therealong for slidably receiving and holding a wiper blade unit and which respectively have different lengths to span different lengths of a blade unit between their respective endmost sets of claws, said refill unit including an elastic wiper blade and an elongate resilient spline affixed to said blade for supporting it in wiping position, said spline being slidable into and supportable by the claws of any one of said holders and having an end portion that extends beyond the position relative thereto of an endmost set of claws of the longest of said blade holders when the refill unit is in wiping position thereon, said spline end portion being formed at each of a plurality of locations spaced apart therealong, each of which is suited to a certain one of said holder lengths, with cut-away rigid detent means interengageable with a detent of a clip means for attaching said spline to an endmost set of the claws of a blade holder having that length.

4,442,567

DUST PAN AND REFUSE CONTAINER

John P. Pravettone, 23807 Karen, Warren, Mich. 48091

Continuation of Ser. No. 171,976, Jul. 24, 1980, Pat. No. 4,357,728. This application Sep. 28, 1982, Ser. No. 425,590
Int. Cl.³ A47L 13/52
U.S. Cl. 15—257.4 20 Claims

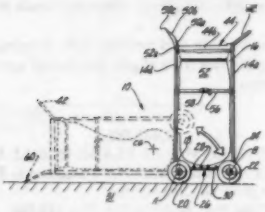
1. A portable dust pan and refuse container for supporting and transporting a flexible bag having a mouth, said portable dust pan and refuse container comprising:

a bag supporting frame operative to distend and substantially enclose said bag in an open mouthed and elongated condition;

means operative to rigidly hold said mouth of said bag open for receiving refuse;

a plurality of spaced, ground contacting wheels rotatably mounted to said bag supporting frame on a common axis to permit selective rotational repositioning of said container about said common axis from a first substantially vertical refuse position to a second, substantially horizon-

tal refuse collecting position, said ground contacting wheels remaining in contact with the ground in each of said first and second transporting positions and in all rotational positions of said frame therebetween; and



a dust pan depending from said bag supporting frame adjacent said mouth and projecting angularly outwardly therefrom, said dust pan operating to abut the ground when said container is in said second position such that said portable dust pan and refuse container is supported by said wheels and said dust pan in said second position.

4,442,568

DEVICE FOR SIMULTANEOUSLY DESHIRRING, SMOOTHING AND BRAKING A SHIRRED TUBULAR CASING

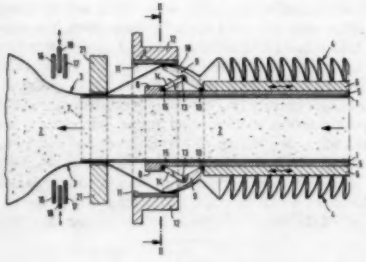
Rudolf Petry, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfort am Main, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,370

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124025

Int. Cl.³ A22C *11/00*

U.S. Cl. 17—33 **7 Claims**



1. A device for deshirring, smoothing and braking a shirred tubular casing during the stuffing of the tubular casing with a fluid mass which flows under pressure out of the stuffing horn of a stuffing machine into the tubular casing, said device comprising first and second outer tubes arranged coaxially over each other on the stuffing horn whereby the innermost, first outer tube surrounds the stuffing horn, one of said outer tubes being fixed in position and the other outer tube being longitudinally displaceable and lockable into position, said device further comprising elements which deshirr, smooth ahd brake the tubular casing during the stuffing operation comprising pivotable bodies with smooth surfaces which are pivotably fastened at one of their ends by pivotable mounts to the end of one of said outer tubes and further are pivotably attached by pivotable joints to a connecting arm which in turn is pivotably fastened to a supporting mount at the end of the other outer tube, and a fixed stop cylinder having a substantially annular cross-sectional configuration surrounding said elements and spaced therefrom.

4,442,569

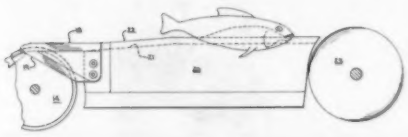
METHOD AND APPARATUS FOR REMOVING GILLS, VISCERA AND KIDNEY FROM HEAD ON FISH

Bernard C. Brower, and Trevor T. Wastell, both of Gladstone, Mich., assignors to A. W. Manufacturing Inc., Gladstone, Mich.

Filed Jul. 10, 1981, Ser. No. 282,024

Int. Cl.³ A22C *25/14*

U.S. Cl. 17—52 **18 Claims**



15. A method of removing the gills, viscera and bloodline kidney from head on fish comprising the steps of aligning the mouth and belly of the fish with a pair of belly cutting blades, passing the fish over the belly cutting blades to make a pair of spaced longitudinal incisions in the fish at a cutting height whereby the tongue is cut from the jaw but not from the gills, removing the tongue and gills of the fish by passing the fish over a gill removal wheel having a plurality of radially extending bores in its circumference that pulls on the tongue to extract the gills from their gill cavities leaving the head intact, and transporting the fish respectively over viscera and kidney removal means.

4,442,570

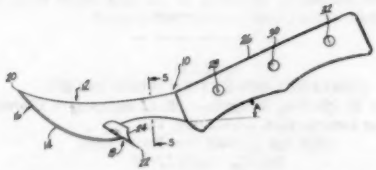
STUFFED SHRIMP PREPARATION TOOL

Alan W. Lynn, 2 Murphy's La., Shelton, Conn. 06484, assignor to Alan W. Lynn, Shelton, Conn.

Filed Sep. 3, 1982, Ser. No. 414,613

Int. Cl.³ A22C *29/02*

U.S. Cl. 17—73 **6 Claims**



1. A tool particularly adapted for removing the legs and bottom part of a shell of a shrimp or prawn and for cutting the meat of said partially deshelled shrimp comprising:

an integral body defining a blade portion and a handle portion;

said blade portion having two opposite sides with one side having both a continuous cutting edge portion and a cup-shaped portion, said cup-shaped portion positioned between said cutting edge portion and said handle portion and reversely facing said handle portion;

said two opposite sides of said blade portion meet at a point away from said handle portion and said point forms one end of said continuous cutting edge portion and said continuous cutting edge portion is continuously curved upward from said cup shaped portion toward said other opposite side of the blade portion;

said cup-shaped portion having

(a) a point at the outer end of said cup-shaped portion adapted to hook under the bottom part of the shell of a shrimp when in use; and

(b) edges on each side of said cup-shaped portion to catch the legs of said shrimp when in use;

said handle portion adapted to be held in a user's hand dur-

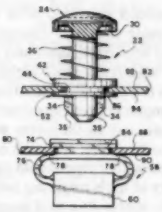
ing said shell removing and meat-cutting steps, and said continuous cutting edge and said cup-shaped portion adapted to make both cutting and leg-removing operations on the bottom of a shrimp in one draw.

4,442,571

SELF-EJECTING FASTENER STUD

George R. Davis, Islip; Robert Hildebrand, Wantagh, and Harold Purcell, East Northport, all of N.Y., assignors to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Aug. 4, 1982, Ser. No. 405,256
Int. Cl.³ A44B *17/00*
U.S. Cl. 411—552 2 Claims



1. In a self-locking quick acting fastener of the type having a receptacle and a stud interengageable therewith upon relative rotation, the improved self-ejecting fastener assembly comprising:

a stud element having an enlarged head portion and a shank portion extending therefrom and having coupling means near its opposite end for locking interengagement with the receptacle, said head portion having a dependent peripheral flange forming an annular recess in the undersurface of the head;

a collar member positioned on and slidable along the shank portion of the stud element and having a central opening through which the shank portion of the stud element extends and which has a configuration generally similar to but smaller than the combined cross-section of the shank portion and coupling means, said collar portion being made of resilient material so that distention of the material permits insertion of the coupling means and shank portion of the stud through the central opening but providing a frictional fit that will prevent accidental removal of the collar member therefrom, said collar member having an upstanding flange of the same diameter as the flange on the head portion of the stud element and in alignment therewith forming a recessed upper surface on the collar member; and

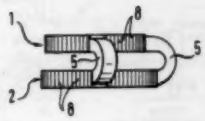
a spring member surrounding the shank of the stud member and extending between the undersurface of the head portion and the collar member, to normally hold them in spaced relationship, but so as to permit the shank portion to be projected through the collar member so that the coupling means can be interengaged with the receptacle upon rotation of the stud member and so that the flange of the head portion of the stud element engages the flange of the collar member forming an enclosed recess with the spring being encased therein.

4,442,572

CLIP FOR FIXING MALE AND FEMALE PARTS OF GROUND GLASS JOINTS

Hermann Keck, Blauenstrasse 13, 4106 Therwil, Switzerland

Filed Sep. 30, 1982, Ser. No. 429,863
Claims priority, application Switzerland, Oct. 6, 1981, 6405/81
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—562 8 Claims



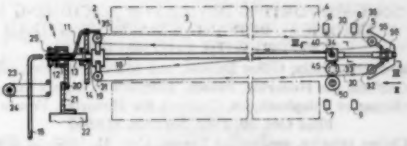
1. Device for holding together the male and female part of glass joints, consisting of two rings (1+2) concentrically placed one above the other, characterized in that each of the rings has an opening (3+4) at the side which extends entirely through the side of said ring in a direction perpendicular to the centerline axis of said rings and that said rings are connected on the outside by bow-shaped side-pieces (5).

4,442,573

DEVICE FOR INTERMEDIATE STORAGE OF THREAD

Kurt Hirschburger, Der Schöne Weg 90, D-7410 Reutlingen, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 297,537
Claims priority, application Fed. Rep. of Germany, Sep. 9, 1980, 3033827
Int. Cl.³ D02G *1/16*; B65H *51/20*
U.S. Cl. 28—271 2 Claims



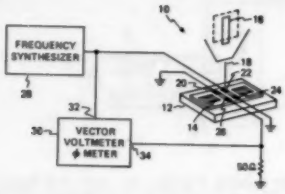
1. A device for intermediate storage of thread comprising a belt conveyor, a winding head having a thread guide arranged along a circular path through which the thread, in the form of loops, is laid upon a front area of the belt conveyor moving in a feed direction, and having a device for taking off the thread at a rear area of the belt conveyor, wherein there is provided a rotating drive member for activating the belt conveyor, which member rotates in said feed direction, in frictional contact with the belt conveyor, the moving speed of the drive member in said feed direction of the belt conveyor essentially corresponding to the moving speed of said belt conveyor in said feed direction, wherein the belt conveyor is arranged horizontally and is provided with a horizontal shaft, the weight of the belt conveyor being at least partially borne by the drive member which braces support means connected to the horizontal shaft and arranged within the inside of the loops, and whereby the belt conveyor is arranged around the shaft and extends essentially in longitudinal direction of the shaft, and wherein the winding head is positioned at one end of the shaft and wherein the winding head lays thread loops upon the conveyor in such a way that during operation of the device at least part of the length of the shaft is located inside the thread loops, wherein the belt conveyor is mounted in a manner providing rotation around its longitudinal axis and wherein the rotating drive wheel forms a support extending from the outside within the area of the loops, which support prevents pivoting of the belt conveyor around its longitudinal axis.

4,442,574

FREQUENCY TRIMMING OF SAW RESONATORS

Stephen Wanuga; Wendell M. T. Kong, both of Liverpool, and Cleo M. Stearns, Jamesville, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jul. 26, 1982, Ser. No. 402,025
Int. Cl.³ H01L 41/22
U.S. Cl. 29—25.35 7 Claims



1. A method of frequency trimming surface acoustic wave devices having a pair of reflecting gratings and a pair of interdigitated transducers located in a resonance cavity comprising the steps of:

(a) depositing a plurality of frequency trimming metallizations in gaps separating said reflecting gratings from said transducers;

(b) measuring the resonance frequency of said SAW device;

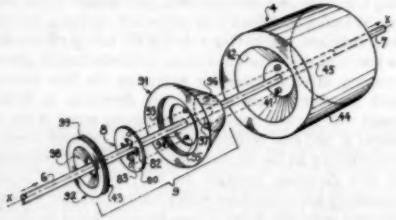
(c) removing a portion of at least one of said plurality of metallizations from said SAW device by laser vaporization to alter said resonance frequency until a desired predetermined operating frequency is achieved.

4,442,575

TOOL-SUPPORTING DEVICE FOR MACHINING A CYLINDRICAL ROD AND A MACHINING HEAD FITTED WITH SAID DEVICE

Jean-Pierre Hulin; Gilles DuBois, and Marcel Paumier, all of Conflans Ste Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans Ste Honorine, France

Filed Oct. 30, 1981, Ser. No. 316,943
Claims priority, application France, Dec. 31, 1980, 80 27888
Int. Cl.³ B23P 13/02; B23D 5/02
U.S. Cl. 29—33.5 9 Claims



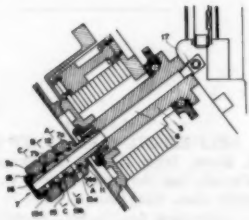
1. In combination: a machining head provided with a recess of a generally conical shape and a bore extending therethrough and through which a cylindrical rod to be machined is capable of passing, a tool supporting device for supporting a tool for machining a cylindrical rod, said tool supporting device comprising a support member of generally conical shape having substantially the same slope as said recess in said machining head, and being positioned in said recess, said support member also being provided with a bore extending through said member and with a further recess for receiving a tool, the bore of said machining head and the bore of said support member being in aligned relation with each other.

4,442,576

TOOL COOLING DEVICE FOR MACHINE TOOLS

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Takaoka, Japan

Filed Mar. 8, 1982, Ser. No. 355,454
Claims priority, application Japan, Mar. 16, 1981, 56-37479
Int. Cl.³ B23B 9/00, 51/06
U.S. Cl. 29—39 1 Claim



1. A tool cooling device for machine tools said device comprising:

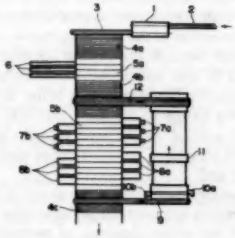
distributing unit means provided with a fixed shaft and a plurality of annular members rotatably mounted on the outer surface of said fixed shaft and each having a pipe fitting portion, said fixed shaft including a hole formed therethrough in the axial direction thereof and a plurality of passages arranged at predetermined spaces and opening to said axial hole and to the outer surface of said fixed shaft in the same direction, and each of said annular members is connected with a pipe at said pipe fitting portion to one of a plurality of tools requiring cooling and accommodated at suitable spaces in a tool magazine, and said pipe fitting portions of each said annular member is aligned communicating with only one of said plurality of passages whereby said tools are automatically and selectively supplied with a cooling fluid through said axial hole formed through said fixed shaft upon placement of said tools in a work position.

4,442,577

PROCESSING OF STEEL PIPES OR ROUND BARS

Masachik Numano, Yokosuka, and Minoru Morita, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,217
Claims priority, application Japan, Dec. 19, 1980, 55-178814
Int. Cl.³ B23Q 7/16
U.S. Cl. 29—33 T 3 Claims



1. Apparatus for conditioning cylindrical workpieces, said apparatus comprising:

an axial transfer line system for axially feeding cylindrical workpieces such as steel tubes and round bars formed by a preceding forming operation;

a single transverse transfer line system connected trans-

versely with said axial transfer line system for transversely feeding said workpieces;

conditioning means arranged on at least one side of said transverse transfer system for performing cutting processing operations on the end portions of the workpieces including beveling for welding, chamfering for starting thread cutting, thread cutting, and lead cutting;

inspection means for performing inspection operations on processed portions of said workpieces including inspection of beveled and chamfered portions and inspection of threaded portions;

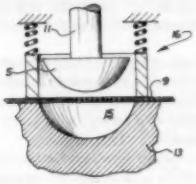
said single transverse transfer line system having a portion with a feed pitch that is variable in steps, said portion positioned within the end processing area for each workpiece; and

said conditioning means and said inspection means being multifunctional and capable of performing plural functions and positioned at a variable feed pitch portion of the transverse transfer line system in a number corresponding to the maximum value of the feed pitch steps of said transverse transfer line.

4,442,578
METHOD OF MAKING HOT DRAWN LOW FRICTION BEARING

Charles S. White, 35815 42nd St., Palmdale, Calif. 93550

Filed Mar. 20, 1980, Ser. No. 132,263
Int. Cl.³ B21D *53/10*
U.S. Cl. 29—149.5 S **5 Claims**



1. A process for making a low friction bearing having a metal backing and a nonflat fabric bearing surface, said process comprising the steps of:

placing in overlapping relationship a low friction fabric having a generally flattened condition and a metal backing having a nonflat surface;

using the metal backing as a punch or die and urging said nonflat surface of said metal backing and said low friction fabric together with sufficient force to adhere said fabric to said backing across their mutually engaged surfaces and to form said fabric into a nonflat low friction bearing surface.

4,442,579
METHOD OF AND APPARATUS FOR PRODUCING VALVE ROTORS

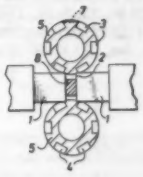
Barry J. Millard, Reading, England, assignor to Adwest Engineering Limited, Reading, England

Filed Oct. 28, 1981, Ser. No. 315,743
Claims priority, application United Kingdom, Dec. 12, 1980, 8038610
Int. Cl.³ B21D *53/00, 53/10*
U.S. Cl. 29—157.1 R **14 Claims**

1. Apparatus for imparting a required metering form to the longitudinal outer edges of a plurality of axially extending and circumferentially spaced grooves formed in a rotor member of a rotary valve with arcuate segments extending between the circumferentially spaced grooves, the apparatus comprising at least one impressing tool having the required metering form thereon, holding means for supporting a said rotor member, means for moving said tool into deforming contact against a one longitudinal edge to be formed along a path of travel described by a chord extending between said one edge and the adjacent edge of the nearest adjacent groove to displace the material of said one edge, supporting means for engaging said adjacent edge of the nearest adjacent groove to provide support therefor whilst said edge is being formed, and indexing means for said holding means for positioning each arcuate segment of the rotor member between said impressing tool and said supporting means so that said impressing tool travels into a respective groove.

7. The method of producing a rotor member for a rotary valve, the method including the steps of

providing a cylindrical rotor member having a pluraility of axially disposed and circumferentially spaced grooves



formed in the outer surface thereof with each groove being defined by a pair of longitudinal outer edges on the periphery of the cylindrical rotor member whereby the longitudinal outer edge on one groove is generally parallel with the adjacent edge on the next adjacent groove,

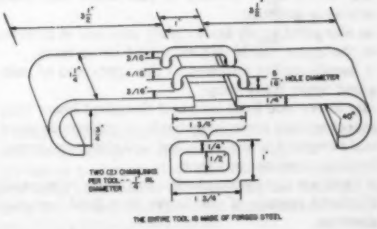
contacting two adjacent outer edges on two adjacent grooves with a pair of coacting impressing tools by positioning said tool in said grooves, each of said tools having a required metering form on its contacting surface,

moving the tools simultaneously towards each other along a path of travel described by a chord that passes through the two adjacent edges whereby material in the contact region is displaced generally inwardly and upwardly away from the groove.

4,442,580
COIL SPRING TOOL

Dimitrios Antoniadis, 3475 Bivona St., Bronx, N.Y. 10475

Filed Apr. 3, 1981, Ser. No. 219,939
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—227 **4 Claims**



1. A tool for maintaining an automotive coil spring in a compressed state during installation in an automobile chassis comprising:

two elongated flat plates, each of which is curved in a hook-like fashion at one end thereof for releasably gripping a coil of said coil spring, the other end of each said plate having two spaced apart circular apertures extending therethrough generally perpendicular to the plane of said plate, the spacing between the apertures in one said plate being substantially equal to the spacing between the apertures in the other said plate, the apertures in each said

plate being spaced equidistant from the respective curved end of said plate; and

two substantially identical parallel chain link means having cross-sectional diameters substantially equal to said apertures respectively extending through said apertures in the elongated plates for interconnecting said plates in such manner as to form a pivoted connection therebetween with the curved ends of said plates being substantially parallel, whereby the two chain link means prevent twisting of either said elongated plate about its longitudinal axis relative to the other said elongated plate.

4,442,581

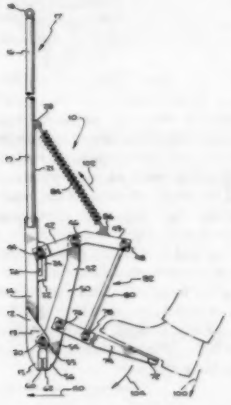
BUTTON PUNCHER OR CRIMPER

Melvin Molnick, 924 W. Ninth St., Upland, Calif. 91786

Filed Feb. 2, 1982, Ser. No. 345,815

Int. Cl.³ B23P *11/00*

U.S. Cl. 29—243.5 **8 Claims**



1. An improved button puncher or crimper comprising:

a. a lower base fixed jaw receiving member comprising a rearwardly protruding portion and a lower substantially flat rearward portion beneath the rearwardly protruding portion;

b. an elongated lower fixed body rigidly attached at its lower end to the upper portion of said lower base fixed jaw receiving member;

c. an elongated upper body rigidly attached at its lower end to the upper end of said elongated lower body;

d. a handle rigidly attached to the upper end of said elongated upper fixed body;

e. said lower base fixed jaw, said elongated lower body, and said elongated upper body having a uniform forward face;

f. said elongated lower body and said elongated upper body having a uniform rear face;

g. a fixed jaw rigidly attached to the lower substantially flat rearward portion of said lower base fixed jaw receiving member;

h. a cantilever arm receiving member rigidly attached to the rear face of said elongated lower body member;

i. said cantilever arm receiving member comprising a bracket with an elongated chamber between the bracket and the rear face of said elongated lower body member;

j. a movable cantilever arm;

k. said movable cantilever arm containing a first pivot means adjacent one end, a second pivot means adjacent its central longitudinal area, and a third pivot means adjacent its opposite end;

l. said movable cantilever means being slidably and rotatably supported within said elongated chamber of said cantilever arm receiving member by said first pivot means;

m. a spring interconnecting said movable cantilever arm to the rear face of said elongated upper body member;

n. a movable jaw receiving member comprising an upper shaft portion and a lower base portion which further comprises a forwardly protruding upper portion and a lower substantially flat forward portion beneath the forwardly protruding portion;

o. a movable jaw rigidly attached to the lower substantially flat forward portion of said lower base portion of the movable jaw receiving member;

p. the upper end of the upper shaft portion of said movable jaw receiving member being movably and rotatably attached to said movable cantilever arm by said second pivot means;

q. the rearwardly protruding protion of said lower base fixed jaw receiving member being movably and rotatably connected to the forwardly protruding portion of the lower base portion of said movable jaw receiving member by a movable jaw receiving means such that said fixed jaw and said movable jaw face each other;

r. said movable jaw receiving member containing a fourth pivot means located in the lower area of its upper shaft portion;

s. an elongated cantilever foot pedal arm containing a foot pedal at one end;

t. said elongated cantilever foot pedal arm being movably and rotatably connected at its end opposite the foot pedal to said movable jaw receiving member by said fourth pivot means;

u. said elongated cantilever foot pedal arm containing a fifth pivot means between said fourth pivot means and said foot pedal; and

v. an elongated connecting arm being movably and rotatably attached at one end to said movable cantilever arm by said third pivot means and being movably and rotatably attached at its other end to said elongated cantilever foot pedal arm by said fifth pivot means;

w. whereby a downward force applied to said foot pedal is transmitted through said elongated cantilever foot pedal arm to said elongated connecting arm, to said movable cantilever arm and then to said movable jaw receiving member thereby causing said movable jaw receiving member to rotate about said movable jaw receiving means so that the movable jaw is forced to close against the fixed jaw with the result that any adjacent pieces of metal which may have been placed between the jaws when open will then be button punched, pressed or crimped together, and further wherein the force applied to said foot pedal is substantially enhanced at the site of the fixed and movable jaws by a double leverage action arising from the distance between said second pivot means and said third pivot means and further by the height of the upper shaft portion of the movable jaw receiving member over the height of the lower base portion of the movable jaw receiving member and wherein said spring causes that fixed and movable jaws to return to their opened position and said foot pedal to return to its elevated position once the downward force on the foot pedal is released.

4,442,582

METHOD OF RECLAIMING COMPONENT MATERIALS

George Foo, Princeton; Raymond W. Grodkiewicz, Bridgewater; Stanley E. Kubis, Bayonne, and Gordon C. Lindsay, Red Bank, all of N.J., assignors to AT&T Technologies, Inc., New York and Nassau Recycle Corporation, Staten Island, both of, N.Y.

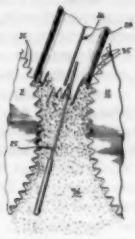
Filed Jun. 21, 1982, Ser. No. 390,717

Int. Cl.³ B23Q *17/00*

U.S. Cl. 29—403.3 **6 Claims**

1. A method of reclaiming component materials of an article of manufacture having a metallic element at least partially encased within a brittle bulb with a portion of the element encased within the bulb being of a predetermined thickness,

and which method comprises the steps of passing the article between two rotating rollers spaced apart a distance less than a dimension of the brittle bulb but greater than the thickness of



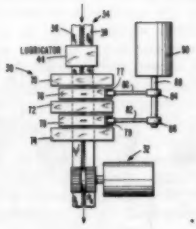
the metallic element encased portion thereby shattering the bulb without altering the structure of the metallic element encased portion substantially, and then separating the shattered brittle material from the metallic element.

4,442,583

SHEARING SLIDE FASTENER CHAIN

George B. Moertel, Conneautville, Pa., assignor to Talon, Inc., Meadville, Pa.

Filed Jul. 26, 1982, Ser. No. 401,777
Int. Cl.³ B21D *53/50*; A41H *37/06*
U.S. Cl. 29—408 **15 Claims**



1. A method of manufacturing a slide fastener chain comprising the steps of

forming a length of slide fastener chain having a pair of support tapes and a pair of rows of interlocking fastening elements secured on inner edges of the tapes,

moving the length of slide fastener chain through a shearing station, and

shearing the interlocking fastening elements and inner edges of the tapes as the slide fastener chain passes through the shearing station so as to substantially lower operating resistance of the slide fastener chain,

said shearing at least partially being in a direction parallel to the plane of the tapes of the slide fastener chain and crosswise to the rows of interlocking fastening elements.

4,442,584

NUT INSTALLATION APPARATUS, METHOD AND CONTROLS

Jon M. Smallegan, Farmington Hills, Mich., assignor to Multifastener Corporation, Detroit, Mich.

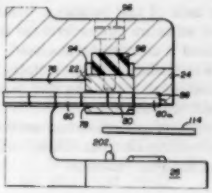
Continuation-in-part of Ser. No. 118,931, Feb. 6, 1980, Pat. No. 4,348,796. This application Jul. 13, 1982, Ser. No. 397,946
Int. Cl.³ B23P *11/00, 21/00, 19/00*
U.S. Cl. 29—432 **12 Claims**

1. A method of attaching self-locking nuts to a panel, said nuts having a projecting pilot adapted to pierce the panel and mechanically interlock with said panel, the method comprising the following steps:

(a) supporting said panel on a movable die opposite a stationary nut anchor,

(b) disposing the end nut of a plurality of serially aligned nuts in said nut anchor opposite said panel with said nut pilot projecting toward said panel,

(c) moving said die member toward said nut anchor and said panel into engagement with said end nut, flexing said panel and biasing the remaining nuts out of alignment with



said end nut and sensing the movement of said remaining nuts relative to said end nut and discontinuing the movement of said die if the relative movement of said remaining nuts indicates that said end nut is not properly located in said nut anchor, thereby preventing fracture of a nut partially located beneath said nut anchor, and

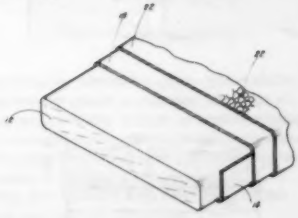
(d) continuing to move said die and the supported panel into locking engagement with said end nut if said end nut is properly located in said nut anchor, said pilot piercing said panel and locking said end nut on said panel.

4,442,585

METHOD OF CONSTRUCTION FOR THERMAL AND ACOUSTIC INSULATION BLANKETS

Fred N. McGehee, Sr.; Billy J. Peck; Clyde B. Betz, and Calvin R. Morgan, Jr., all of P.O. Box 568, Harvey, La. 70058

Filed Mar. 31, 1982, Ser. No. 363,871
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—432 **1 Claim**



1. A method of constructing thermal and acoustic insulation blankets, which comprises the following steps:

a. providing a ceramic fiber thermal insulation core, said core being substantially the basic shape of the object to be insulated; cutting said insulation core material along pattern lines with a cutter means;

b. providing noise abatement means, said noise abatement means comprising a thin sheet of lead, substantially in the shape of said insulation core means;

c. enveloping said insulation core with said lead sheet to provide substantially the same shape as said insulation core; further providing a contamination insulation means, wherein said means comprises a thin stainless steel foil/-fiberglass cloth laminate;

d. placing said stainless steel laminate along the innermost surface of said insulation core, so that said laminate serves as a barrier between said insulation core and the object to be insulated;

e. enveloping said insulation core blanket with a silicone-rubber coated fiberglass cloth;
f. stitching the seams of said cloth around said inner core insulation means with stainless steel staple means;
g. providing an outer jacket of a flexible knitted stainless steel wire mesh means, said wire mesh means forming a "stocking" containing the insulation blanket;
h. stitching the ends of said stocking with said stainless steel staples;
i. wrapping the object to be insulated in said insulation blanket;
j. mating the ends of said insulation blanket along a single seam so that an entire circumferential surface of said pipe to be insulated is completely insulated;
k. providing a secondary insulation means, which comprises a velcro lead-lined flap along said mating edge of said insulation section; and
l. lacing the ends of said insulation section against one another for providing a barrier substantially impermeable to thermal and acoustic radiation.

4,442,586

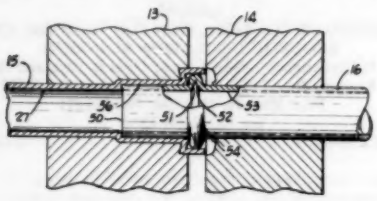
TUBE-TO-TUBE JOINT METHOD

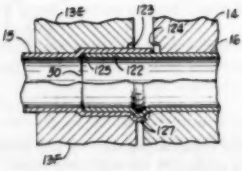
Ralph G. Ridenour, 626 Lexington-Ontario Rd., Mansfield, Ohio 44903

Continuation of Ser. No. 951,579, Oct. 16, 1978, Pat. No. 4,269,438, which is a continuation-in-part of Ser. No. 527,683, Nov. 27, 1974, Pat. No. 4,200,314, which is a division of Ser. No. 425,561, Nov. 17, 1973, abandoned. This application May 14, 1981, Ser. No. 263,493

Int. Cl.³ B21D *39/00*; B23P *11/02*

U.S. Cl. 29—511 **14 Claims**





1. The method of making a tube-to-tube joint directly between a first tube and a cylindrical end of a second tube, and utilizing mandrel means and first and second die means, comprising the steps of:

grasping the first tube with the first die means;

moving the mandrel means and the first die means relatively axially together to form in one end of the first tube a radially enlarged first portion and to form a first shoulder at the junction between said enlarged first portion and the main body of the first tube;

said enlarged first portion having an inner diameter slightly larger than the nominal outside diameter of one cylindrical end portion of the second tube;

removing the mandrel means;

grasping the second tube at said one cylindrical end portion thereof with the second die means;

relatively axially moving together the grasped portions of the tubes to cause said end of the second tube to enter said enlarged first portion of the first tube and to abut and have movement arrested at said first shoulder and continued axial relative movement of the grasped portions of the tubes causing first and second annular portions of the inner wall of the second tube to bulge outwardly from a cylindrical shape to form an annular bead;

forming in said first tube a second enlarged portion closer to said one end than said first enlarged portion and a second shoulder between said first and second enlarged portions;

continued relative axial movement between the grasped portions of the tubes causing said first and second annular portions of the inner wall of the second tube to be compressed into mutual engagement;

continued relative axial movement between the grasped tubes establishing fluidtight seal means between said annular bead of the second tube and said second shoulder of the first tube; and

said fluidtight seal means capable of withstanding pressures of several atmospheres.

4,442,587

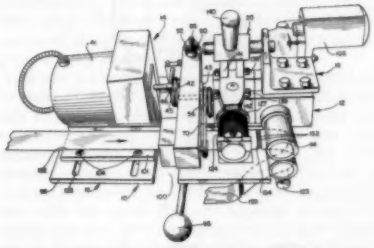
STRIPPING MACHINE FOR REMOVING INSULATION FROM FLAT CABLE

Charles E. Shields, 655 Woodland Dr., Crystal Lake, Ill. 60014, and Leonard R. Giese, 1307 Post Dr., Rockford, Ill. 61108

Filed Jun. 22, 1981, Ser. No. 275,838

Int. Cl.³ H02G *1/12*

U.S. Cl. 29—564.4 **9 Claims**



1. A stripping machine for removing insulation from flat cable having a plurality of conductors contained therein, wherein the conductors are in substantially the same plane, comprising:

a frame;

a pair of rotatable grinding wheels mounted to said frame and being engageable with opposite sides of the flat cable for grinding insulation from the cable above and below the conductors;

means for rotatably mounting said pair of grinding wheels on said frame, said means for rotatably mounting comprising a motor means;

a pair of rotatable slitting rollers for cutting portions of the insulation between conductors, one of said pair of slitting rollers being mounted oppositely to the other of said pair of slitting rollers to form a space therebetween through which the cable portion to be prepared is positioned;

means for rotatably mounting said pair of slitting rollers to said frame; and

means for moving one of said pair of slitting rollers/toward and away from the other of said pair of rollers in a direction transverse to said direction parallel to the length of the cable,

drive means for moving the cable along a direction parallel to the length of the cable, whereby the insulation of the cable is removed above, below, and on the sides of the

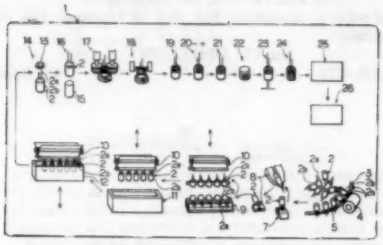
conductors at a portion of the cable to prepare it for subsequent attachment to a connector.

4,442,588

AUTOMATIC SYSTEM FOR PRODUCING ELECTROLYTE IMPREGNATED CAPACITOR ELEMENTS

Katsumori Omata, Hachioji, Japan, assignor to Far East Engineering Co., Ltd., Hachioji, Japan

Filed Mar. 25, 1981, Ser. No. 247,243
Claims priority, application Japan, Apr. 10, 1980, 55-47232
Int. Cl.³ H01G *9/00*
U.S. Cl. 29—570 **8 Claims**



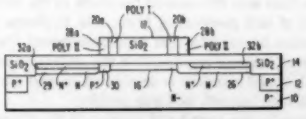
1. A system for automatically producing electrolyte impregnated capacitor elements each having a head and a pair of leads, said system comprising means for clamping the leads of each capacitor element to straighten and place the leads in parallel alignment as the capacitor element is conveyed thereto; means for aligning a predetermined number of reformed capacitor elements; holder means for taking up the aligned capacitor elements from the capacitor element aligning means as the holder means holds the leads of aligned capacitor elements; means vacuumized to impregnate the aligned capacitor elements with the electrolyte as the capacitor elements are brought thereinto and as such capacitor elements are held by the holder means; and transmission means including a first transmission device for conveying each capacitor element from the lead reforming means to the capacitor element aligning means, and a second transmission device for conveying the holder means into the electrolyte impregnating means.

4,442,589

METHOD FOR MANUFACTURING FIELD EFFECT TRANSISTORS

Ven Y. Doo, San Jose, Calif., and Paul J. Tsang, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 5, 1981, Ser. No. 240,677
Int. Cl.³ H01L *21/265, 21/28*
U.S. Cl. 29—571 **9 Claims**



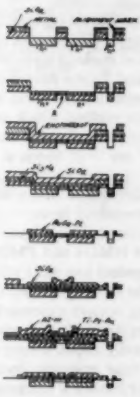
1. A method of forming a transistor which comprises:
(a) providing a semiconductor substrate of one conductivity type having a shallow surface layer of opposite conductivity type;
(b) forming a thick mesa of dielectric material on said substrate;
(c) forming a first layer of polycrystalline silicon only on the vertical surfaces of said mesa by reactive ion etching;
(d) introducing at least one impurity into said substrate, said mesa and said first layer of polycrystalline silicon masking said substrate against the introduction of said at least one impurity;
(e) forming a second layer of polycrystalline silicon by reactive ion etching;
(f) introducing at least one impurity of a different conductivity type from said first at least one impurity into said substrate at areas other than those masked by said mesa, said first polycrystalline silicon layer and said second polycrystalline silicon layer to thereby form the gate of said transistor.

4,442,590

MONOLITHIC MICROWAVE INTEGRATED CIRCUIT WITH INTEGRAL ARRAY ANTENNA

Ronald J. Stockton, Nederland, and Robert E. Munson, Boulder, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Division of Ser. No. 207,289, Nov. 17, 1980. This application Jun. 22, 1982, Ser. No. 390,859
Int. Cl.³ H01L *21/82*
U.S. Cl. 29—571 **1 Claim**



1. A method for fabricating planar phase shifter for a monolithic microwave system comprising the steps of:
lapping and polishing a layer of semi-insulating GaAs to a plane parallel thickness compatible with microstrip propagation, said layer serving as a substrate for said monolithic microwave system;
covering the substrate with SiO_2 and a metal;
opening windows in said metal;
removing the SiO_2, exposed through said windows by dry etching;
ion implanting to form N+ regions;
removing the remaining metal and SiO_2 from a source to drain gap region;
ion implanting an active layer;
defining an alignment mark by ion milling;
removing any remaining metal and photo-resist material;
depositing a nitride and an oxide;
annealing the implantations;
removing the insulators;
defining ohmic contact holes using a photolithographic technique;
depositing metallizations of AuGe-Pt;
depositing a layer of SiO_2;
defining gate and ohmic contact holes;
removing exposed SiO_2 by plasma etching;
depositing metallizations of TiPtAu;
defining gate and circuit path areas using a photo-resist technique; and

removing exposed metal by ion-milling to form microstrip transmission lines, radiating elements and biasing interconnect metallizations.

4,442,591

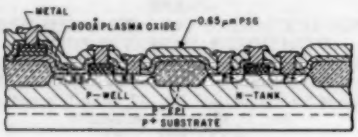
HIGH-VOLTAGE CMOS PROCESS

Roger A. Haken, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 1, 1982, Ser. No. 344,588

Int. Cl.³ H01L *21/265, 21/76*

U.S. Cl. 29—571 **11 Claims**



1. A high-voltage CMOS process, comprising the steps of:

providing a silicon surface;

providing N-type device regions in said surface;

providing P-type device regions in said surface;

depositing a moat masking layer on respective moat areas of said N-type and P-type device regions;

applying a channel stop implant into portions both of said N-type device regions which are exposed by said moat masking layer, said channel stop implant comprising at least 5×10^{12} cm^{-2} of boron at an energy of at least 45 keV;

selectively oxidizing said silicon surface where not masked by said moat masking layer;

stripping said moat masking layer; and

forming desired NMOS and PMOS devices in said respective moat regions.

11. A process for forming desired CMOS circuits for operating at an operating voltage expressed as (10+x), where x is in the range between 0 and 10, comprising the steps of:

providing a heavily doped P-type silicon substrate;

providing a P-type epitaxial layer on said substrate, said epitaxial layer having a thickness in microns of approximately 13+0.6x;

implanting N-type impurities to form N-tanks, said N-tanks having a surface dopant concentration of approximately 10^{16} per cm^3, and said tanks having a depth in microns of approximately 3+0.2x;

implanting P-wells into selected areas of said epitaxial layer, said P-wells having a dopant concentration of approximately 2×10^{15} per cm^3;

depositing a moat masking layer on respective moat areas of said N-tanks and of said P-wells, where devices are to be formed;

applying a channel stop implant into portions both of said N-type device regions which are exposed by said moat masking layer, said channel stop implant comprising at least 5×10^{12} per cm^2 of boron at an energy of at least 50 keV;

selectively oxidizing said epitaxial layer where not masked by said moat masking layer, said oxidizing step being performed to form a field oxide having a thickness expressed in microns of at least 0.8+0.06x;

stripping said moat masking layer;

forming NMOS source/drain regions in said P-wells, and forming PMOS source/drain regions in said N-tanks, said source/drain regions having a maximum depth in microns are 0.5+0.05x, respective pairs of said source/drain regions defining channel regions therebetween, and said channel regions having a length expressed in microns which is not less than 3+0.4x;

depositing gate dielectrics atop said respective channel regions, said gate dielectrics having a minimum thickness expressed in nanometers of 60+4x; and

depositing gates atop said respective gate dielectrics.

4,442,592

PASSIVATED SEMICONDUCTOR PN JUNCTION OF HIGH ELECTRIC STRENGTH AND PROCESS FOR THE PRODUCTION THEREOF

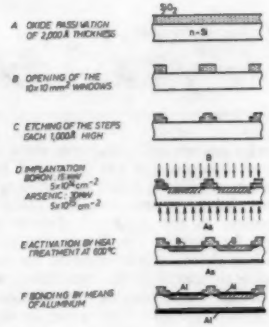
Josef Kemmer, No. 41 D, Hauptstrasse, 8041 Haimhausen, Fed. Rep. of Germany

Filed Jan. 14, 1981, Ser. No. 225,069

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003391

Int. Cl.³ H01L *31/18*

U.S. Cl. 29—572 **12 Claims**



1. A process for the production of a detector chip for detecting radiation and having a semi-conductor pn junction, comprising the steps of:

(a) applying a passivating layer of predetermined thickness to a surface on an n-Si slice for surface passivation of said n-Si slice;

(b) removing a portion of said passivating layer from said surface of said n-Si slice to form a window surrounded by an edge of said passivating layer;

(c) forming a step portion of said edge of said passivating layer about said window; and

(d) implanting a doping material in said n-Si slice within said window and, through said step portion, the portion of said n-Si slice beneath said step portion of said passivating layer surrounding said window;

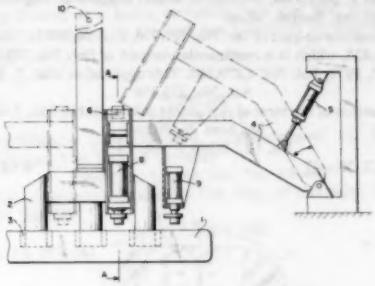
(e) said step portion having a substantially uniform thickness less than said determined thickness of the remaining portion of said passivating layer, said thickness of said step portion being such that a predetermined fraction of the doping material implanted in the surface of said n-Si slice within said window is implanted in said surface of said n-Si slice beneath said step portion;

(f) whereby the peripheral portion of the doped surface of said n-Si slice beneath said step portion of said passivating layer has a uniform doping concentration and thickness across its entire width which thickness is a fraction of the thickness of the doped surface portion within said peripheral portion and said fraction of said doping material penetrating said step portion being sufficient to compensate the accumulated charge in the surface channel beneath said step portion, thus enabling a depletion channel beneath said step portion.

4,442,593
ANODE BUTT REMOVER

Paul M. Holmberg, Oslo, Norway, assignor to Årdal og Sunndal Verk a.s., Oslo, Norway

Filed Aug. 25, 1982, Ser. No. 411,475
Int. Cl.³ B23P 19/04; C25D 17/04
U.S. Cl. 29—825 16 Claims

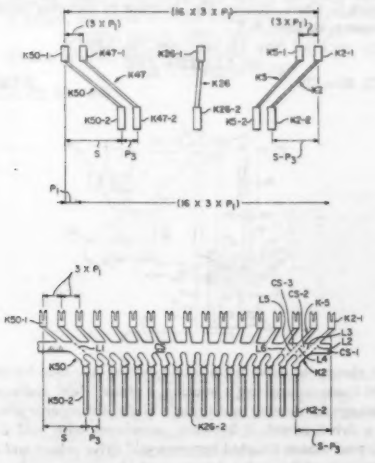


1. A method for removing an anode butt from anode studs having fixed thereto a yoke, said method comprising:
providing plural hydraulic piston-cylinder assemblies;
operating said assemblies in synchronization and exerting a force, parallel to said studs, on the upper surface of said anode butt by said assemblies; and
exerting the reaction force to said force of said assemblies on said yoke, thereby pushing said anode butt from said studs without the need for absorbing said reaction force in an external structure.

4,442,594
METHOD FOR MAKING AN ELECTRICAL CONNECTOR

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Division of Ser. No. 221,396, Dec. 30, 1980. This application Sep. 24, 1982, Ser. No. 422,613
Int. Cl.³ H01R 43/00
U.S. Cl. 29—884 3 Claims

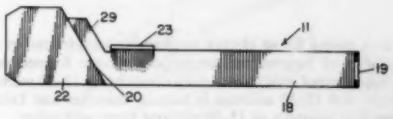


1. In a method for making an electrical connector, the steps of:
(a) forming first and second identical elongate contact strips in manner (1) providing each strip with a continuous central longitudinally extending member which has first and second opposed contact element end portions extending therefrom, and (2) forming each strip to have different spacings in a longitudinal direction between first and second contact element end portions at respective longitudinal ends of such strip;
(b) supporting said first and second strips by securing said first contact element end portions thereof in respective first and second support members and selectively removing material from said central longitudinally extending member to form electrically independent contact elements, each such contact element comprising one of said first contact element end portions and one of said second contact end portions; and then
(c) disposing said first and second support members in a housing and in longitudinally facing relation whereby said second contact element end portions are in positional registry and said first contact end portions are not in registry.

4,442,595
KNIFE GUIDE

Robert F. Sharrow, 224 Longacre Ave., and Sidney L. Sherman, 5956 Jodie La., both of Erie, Pa. 16509

Filed Apr. 5, 1982, Ser. No. 365,170
Int. Cl.³ B65B 7/00
U.S. Cl. 30—2 3 Claims



1. In combination a utility knife and knife guide and support comprising,
a handle part,
a guide part,
a blade support,
a stop,
an end part,
said handle part, guide part, blade support, stop part and end part being integral with each other and of generally uniform thickness,
and having opposite sides lying in planes,
a first plane disposed in one said handle part sides and a second plane disposed in one said guide part sides,
said first plane and said second plane being disposed generally parallel to each other and spaced from each other,
said handle part having a first end and a second end,
said blade support having a first end and a second end,
said first end of said blade support being integrally connected to said first end of said handle part,
said second end of said blade support being integrally connected to a first end of said guide part,
a third plane disposed in one of said blade support sides and generally perpendicular to said first plane and said second plane,
a fourth plane disposed in one of said stop part sides and generally perpendicular to said first plane and said second plane,
said stop part being integrally attached to a side edge of said handle part,
said end part being integrally attached to said second end of said handle part and extending from said handle part in the same direction as said blade support part,
a slot in said blade support part extending generally parallel to said guide part and spaced therefrom,
said utility knife guide being adapted to support a utility knife having a handle having a first end and a second end

with a blade attached to said first end and disposed in said slot and disposed generally parallel to said first plane and spaced therefrom,

said first end of said utility knife handle resting on said blade support part and said second end of said knife handle resing on said end part and said stop engaging a side edge of said utility knife handle whereby said guide part may guide said blade in a path generally paralled to the side edge of a carton engaged by said guide part.

4,442,596

CASING OF A WASHABLE ELECTRIC APPLIANCE

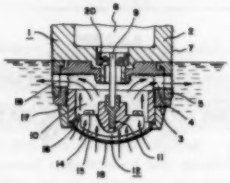
Sataroh Nasu; Kouichi Iwanaga, and Hiroshi Kikuchi, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed May 20, 1982, Ser. No. 380,428

Claims priority, application Japan, Jun. 29, 1981, 56-101819

Int. Cl.³ B26B *19/38*

U.S. Cl. 30—41.5 **3 Claims**



1. A casing for an electric appliance characterized in that a plurality of tapered minute projections are formed on the surface thereof, said minute projections being 15–30 microns in height and 15–30 microns in bottom diameter and being arranged in intervals of 15–30 microns from each other.

4,442,597

SHAVING APPARATUS

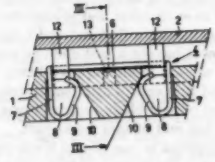
Wijtse Bergsma, and Eelke S. Venema, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 189,463, Sep. 22, 1980, abandoned. This application Nov. 12, 1982, Ser. No. 441,188

Claims priority, application Netherlands, Oct. 18, 1979, 7907682

Int. Cl.³ B26B *19/30*

U.S. Cl. 30—43.6 **2 Claims**



1. A shaving apparatus comprising a housing; a shaving head; a separate one-piece resilient metal wire hinge element for pivotally securing the shaving head to the housing, said wire hinge element being substantially U-shaped, the section between the limbs of the U constituting a hinge pin portion and each limb constituting a connecting portion, each limb being at its outer end at substantially a right angle to the plane of the U, the end of each limb being formed with a hook shape; means on the shaving head for engaging said hinge pin portion and retaining the same in place under tension; and two slots in a wall of the housing for respectively receiving said connecting portions, each slot being formed with a downwardly and inwardly sloping wall for engaging the hook-shaped end of the corresponding connecting portion and retaining the same in place under elastic tension without play.

4,442,598

RAZOR BLADE ASSEMBLY

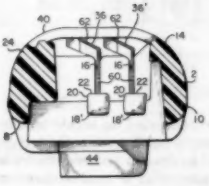
Chester F. Jacobson, Southboro, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 229,976, Jan. 30, 1981, Pat. No. 4,378,634, which is a continuation-in-part of Ser. No. 101,101, Dec. 7, 1979, Pat. No. 4,270,268. This application Mar. 1, 1982, Ser. No. 353,856

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.³ B26B *21/06, 21/22*

U.S. Cl. 30—47 **8 Claims**



1. A razor blade assembly comprising a body member, a guard member fixed to said body member, blade means mounted on said body member for movement thereon, said blade means being independently movable in response to forces encountered during a shaving operation, and spring finger biasing means integral with said body portion and exercising a bias against said blade means, said blade means comprising a shaped member having a base portion and a cutter portion, said base and cutter portions defining therebetween an obtuse angle.

4,442,599

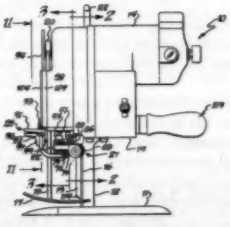
SHARPENER CONSTRUCTION FOR FABRIC CUTTING MACHINE

Frederick G. Clark, Naples, Fla., assignor to Eastman Machine Company, Buffalo, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,724

Int. Cl.³ B25F *3/00*

U.S. Cl. 30—139 **6 Claims**



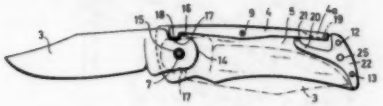
6. A sharpener drive for a fabric cutting machine having a straight blade comprising a housing, a crank wheel and associated linkage for driving said straight blade, a sharpener mechanism, a drive wheel, link means associated with said drive wheel, gear means coupled between said drive wheel and said sharpener mechanism for driving said sharpener mechanism, and a single shaft for both transmitting motion through said link means to effect selective engagement between said crank wheel and said drive wheel and for transmitting motion from

said gear means to said sharpener mechanism, said sharpener mechanism comprising first and second sharpener means, actuating means for moving said first and second sharpener means axially of said knife, means for alternately moving said first and second sharpener means into engagement with opposite sides of said knife including a second linkage which causes said first and second sharpener means to rise before said second sharpener means can engage said knife, said second sharpener means being located at a lower elevation than said first sharpener means to compensate for said rise produced by said second linkage.

4,442,600
JACK-KNIFE

Ernst-Wilhelm Felix-Dalichow, Brauereistrasse 14, D-5650 Solingen, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,493
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037588
Int. Cl.³ B26B *1/02*
U.S. Cl. 30—161 **7 Claims**

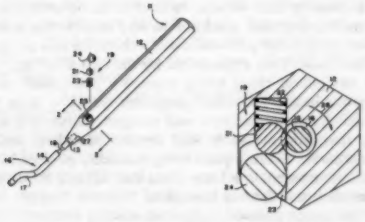


1. Jack-knife, having a holder and a blade hinged to said holder thus that it can be turned between a closed position in which its cutting edge is in a longitudinal slot of said holder and an opened position which is 180° offset to the closed position and in which the blade can be fixed, the holder being composed of two plastics molded joint parts, one of which having an integral spring means which acts against a tiltable latch lever which is pivotable inserted at the back of said holder into said longitudinal slot thus that its latch portion engages a notch in the back of said blade to fix the blade when it is in its opened position.

4,442,601
TOOL HANDLE

Gustav M. Hirsch, Nahariya, and Moshe Bar-Nof, Shlomi, both of Israel, assignors to Noga Engineering Ltd., Shlomi, Israel

Filed Feb. 2, 1982, Ser. No. 345,137
Claims priority, application Israel, Feb. 12, 1981, 62120
Int. Cl.³ B23D *79/08*
U.S. Cl. 30—169 **3 Claims**



1. A handle for a tool having a cylindrical shank with a peripheral notch therein, the handle comprising:

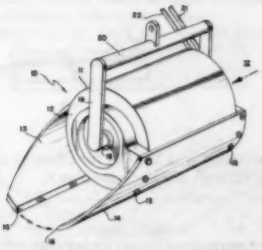
an axial cylindrical aperture defined in said handle for accomodating said tool shank therein; and

retaining means, substantially in said handle having a retaining position and a release position, for retaining said tool by engaging said notch, said retaining means being normally in said retaining position and switchable to said release position upon rotation of said handle with respect to said tool shank in a preselected direction with simultaneous application of an axial force thereto, said shank being rotatable in either of two opposite directions with respect to said handle when the shank is in the axial cylindrical aperture of said handle and said retaining means is in said retaining position.

4,442,602
HORN AND BONE CUTTING DEVICE

Richard F. Byrne, Cromer, and Samuel E. Pierce, Calga, both of Australia, assignors to Jarvis A. N. Z. Pty. Limited, New South Wales, Australia

Filed Jun. 29, 1981, Ser. No. 278,693
Claims priority, application Australia, Nov. 14, 1980, 64408/80
Int. Cl.³ B26B *17/00*
U.S. Cl. 30—180 **4 Claims**



1. A horn or bone cutter comprising a rotary hydraulic driving means; and a pair of cutting blades, each including a cutting edge, said blades extending from said driving means and being driven by said driving means reciprocatably about an arcuate path with unlimited access on each side of each blade and an open end therebetween so that said cutting edges may be introduced transversely of the bone or horn to the cutting position thereof.

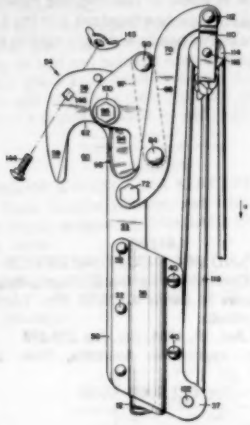
4,442,603
SAWING AND PRUNING APPARATUS OF THE COMPOUND ACTION PASSBY BLADE TYPE

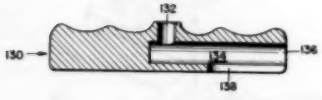
Edward M. Wallace, Longmeadow; Robert G. Gosselin, Springfield, and Ernest D. Labarre, Holyoke, all of Mass., assignors to Wallace Mfg. Corp., Enfield, Conn.

Division of Ser. No. 277,927, Jun. 26, 1981, Pat. No. 4,420,883.
This application Jan. 21, 1983, Ser. No. 460,054
Int. Cl.³ F16G *11/04*
U.S. Cl. 30—249 **2 Claims**

1. In a pruner operable by a means of a rope and pulley for cutting a limb from a tree, an adjustable one-piece hand grip selectively positionable relative to the rope and consisting of a body member having an outer configuration for convenient hand grasping and having an opening extended therethrough

inwardly from an entrance on one side of and outwardly through an exit on another side of the body member with a Vee





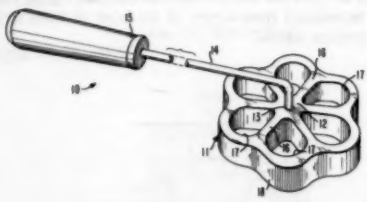
notch communicating with the exit for effecting a bight on the rope extended through the body member.

4,442,604

PASTRY FORMING AND CUTTING UTENSIL

Ronald R. Altman, 9109 Barberry La., Hickory Hills, Ill. 60457

Filed Jan. 13, 1982, Ser. No. 339,112
Int. Cl.³ B26B *3/04*
U.S. Cl. 30—302 **3 Claims**



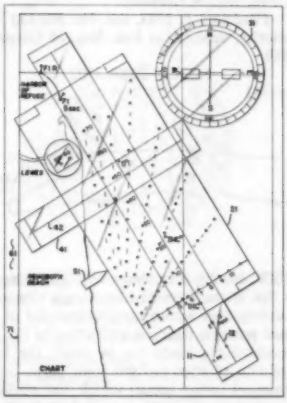
1. A pastry forming and cutting utensil, comprising, in combination, a main body having a central hub portion, a geometrically-shaped, peripheral endless wall in spaced relation around said hub portion, a plurality of equally spaced-apart arms extending radially between said hub portion and said endless wall forming together a unitary member in a single flat plane, with openings being formed between said arms, said body defining a rosette design, said hub portion, said peripheral wall and said arms being cross-sectionally tapered between one flat side of said main body and an opposite flat side thereof, whereby a face of one said sides is narrower in width than a face of the other said side, said narrower face forming a cutting edge when said main body is impressed in a rolled out dough for cutting out cookies therein, said cutting edge of said arms comprising a row of spaced-apart, plurality of additionally narrowed teeth whereby only said teeth cut fully through said dough while intermittent spaces formed between said teeth serve only for said arms to impress a continuous design of said arms in an upper surface of said rolled out dough; and a selectively detachable handle for said main body being screw-threaded in a threaded opening on a wider said face of said hub portion.

4,442,605

DEAD RECKONING NAVIGATION INSTRUMENT

Vernon I. Weihe, 4133 33rd Rd., Arlington, Va. 22207

Filed Jun. 21, 1982, Ser. No. 390,399
Int. Cl.³ G01C *21/20*; G06G *1/16*
U.S. Cl. 33—1 SD **3 Claims**



1. A navigation instrument for measuring the progress of a vessel relative to a designated track, comprising:

a ferrous baseplate;

a navigation chart;

a transparent tracking plate having a trackline marked thereon; and

a transparent overlay plate having a navigation grid marked thereon with said grid comprising time marked lines defined by straight rows of dots emanating from a point beyond the lower left edge of said transparent overlay plate, the horizontal spacing between said dots being proportional to the speed of said vehicle and the vertical spacing of said dots being proportional to the distance traveled by said vehicle, such that the intersection of a timeline with said trackline in said transparent trackline plate defines the position of said vehicle on said navigation chart at the time represented by the said timeline;

said navigation chart being manually positioned on said ferrous base plate; said transparent trackline plate being manually positioned over said navigation chart and affixed by magnetic means to said ferrous baseplate; and said transparent overlay plate being manually positioned over said transparent trackline plate and affixed by magnetic means to said ferrous base plate.

4,442,606

DIGITAL GONIOMETER

Douglas A. Graham, 13 N. Maryland Ave.; Douglas G. Baillet, 16 Oakland Dr., both of Port Washington, N.Y. 11050, and Mark Sankey, 18 Henshaw Ter., Newton, Mass. 02165

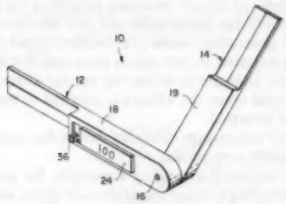
Filed Apr. 12, 1982, Ser. No. 367,578
Int. Cl.³ G01B *3/56, 5/24, 7/30*
U.S. Cl. 33—1 N **6 Claims**

1. A system for measuring an angle, in combination comprising:

first and second elongated arm members, each arm member being substantially similar in structure to the other and each comprising a flat bottom surface, a pair of opposing parallel flat side edges, a rectangular housing portion forming the medial half thereof, a clear plastic flat rectangular plate portion longitudinally extending from the housing portion and forming the distal half thereof, and a longitudinal centerline positioned along the plate portion, the housing of one of said arm members including a hollow compartment;

pin means for pivotally coupling said arm members together at their medial ends, said pin means extending through both said housing portions;

potentiometer means located in said hollow compartment and associated with said pin means for providing an elec-



trical signal indicative of the angle formed between said arm members;

battery means located in said hollow compartment for providing a source of reference voltage to said potentiometer means;

decoding means located in said hollow compartment for translating said electrical signal into a desired angular measurement of the angle formed between said arm members; and

digital display means on the housing of said one arm for displaying the angular measurement provided by said decoding means, whereby said arm members form straight side edges at angles of 0 degrees, 180 degrees, and 360 degrees, and said display can display the angle between 0 and 360 degrees.

4,442,607

MEASURING INSTRUMENT

Hideo Sakata, and Masami Saito, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,965

Claims priority, application Japan, Nov. 25, 1981, 56-188930; Nov. 25, 1981, 56-188931

Int. Cl.³ G01B *7/28;* B23Q *3/02*

U.S. Cl. 33—1 M **5 Claims**

1. A measuring instrument comprising:

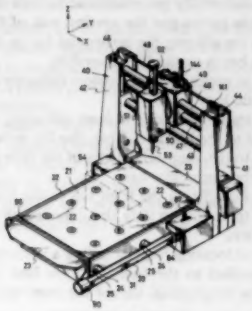
a bedplate supporting a workpiece to be measured, and provided at a side surface thereof with a recessed portion;

a rail support member bonded at proximal end thereof to said recessed portion through a bonding agent, and provided at the forward end thereof with a positioning end face;

guide rails detacheably mounted at the forward end of said rail support member, and positioned by said positioning end face;

an eccentric positioning means provided between the rail support member and the guide rail and pressing the guide rail against the positioning end face of the rail support member in mounting the guide rail to the rail support member;

a movable member movably supported on said guide rail; and



a displacement detector for detecting a displacement of said movable member.

4,442,608

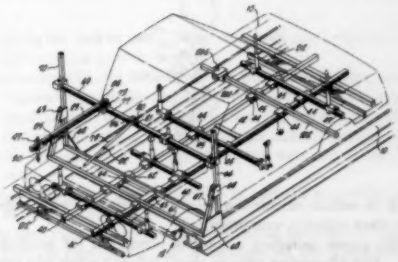
VEHICLE FRAME MEASUREMENT DEVICE

Allan H. Clausen, Lomita, Calif., assignor to Continental Custom Bridge Company, Alexandria, Minn.

Filed Sep. 30, 1982, Ser. No. 431,810

Int. Cl.³ G01B *5/255*

U.S. Cl. 33—288 **6 Claims**



1. A vehicle body-and-frame measurement apparatus for use in realigning the entire structure of a damaged unibody vehicle having reference points when the vehicle is supported on ramps, the ramps having a longitudinal axis and a horizontal plane, the apparatus comprising means for measuring the lower portion of the vehicle body-and-frame comprising:

(a) at least two elongated rails to be supported by the ramps without fixably securing the rails to the ramps, the rails to be supported by the ramps substantially parallel to the longitudinal axis of the ramps;

(b) cross-members between the rails for holding the rails in fixed parallel relationship relative to each other;

(c) a plurality of reference members retained by the rails and means for slideably securing the reference members to the rails so that the reference members can slide along the longitudinal axis of the rails and can slide horizontally perpendicular to the rails;

(d) at least two slideable vertical locators for each of at least two of the reference members slideably retained on the respective reference members, the locators being sufficiently long to reach reference points of the vehicle;

(e) means for fixably securing each vertical locator to its respective reference member;

(f) a pair of vertical uprights supported by the rails and having a vertical axis substantially perpendicular to the horizontal plane of the ramps;

(g) a vertically adjustable horizontal bar slideably attached

to the uprights for positioning above the vehicle frame or within the passenger compartment with the windows open, substantially perpendicular to both the longitudinal axis of the ramps and the vertical axis of the uprights;

(h) means for affixing the horizontal bar to the uprights so that the bar is vertically adjustable;

(i) at least to upper vertical locators slideably attached to the horizontal bar;

(j) a rigid tram rail having at least one scale, the tram being attached to the horizontal bar, the bar being substantially parallel to the longitudinal axis of the rails and perpendicular to the horizontal bar;

(k) means for affixing the tram rail to the horizontal bar so that the tram rail can slide along the length of the horizontal bar; and

(l) a vertical locating base including a vertical locator slideably attached to the tram rail, the base being movable along the longitudinal axis of the tram rail.

4,442,609

VEHICLE ORIENTATION DETECTING DEVICE FOR AN AUTOMOTIVE VEHICLE OR ANOTHER VEHICLE

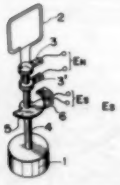
Tetsuo Senoo, Inagi, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Sep. 23, 1981, Ser. No. 305,349

Claims priority, application Japan, Sep. 25, 1980, 55-132369

Int. Cl.³ G01C *17/30, 17/38*

U.S. Cl. 33—356 **14 Claims**



1. A vehicle orientation detecting device for an automotive or other vehicles, comprising:

(a) means including a rotating conductor for generating a first alternating voltage signal induced when said rotating conductor is rotated so as to intersect the geo-magnetic field;

(b) means for generating a second alternating voltage signal having a period equal to an interval of one turn of said rotating conductor; and

(c) means for adjusting the second alternating voltage signal so as to cancel an erroneous signal component of the first alternating voltage signal derived from said first alternating voltage signal generating means so as to provide a normal alternating voltage signal in accordance with the direction of the geo-magnetic field when the vehicle is oriented to a predetermined direction.

whereby a correct indication of the vehicle orientation can be made on a basis of the phase difference between the normal alternating voltage signal and a second alternating voltage signal;

said adjusting means comprising:

(a) a first inverting amplifier connected to said second alternating voltage signal generating means for shifting the phase of the second alternating voltage signal by 180°;

(b) a first variable resistor connected between the input and output terminals of said first inverting amplifier for adjustably deriving the second alternating voltage signal as a voltage with absolute levels ranging from zero to the amplitude of the second alternating voltage signal and which switches in phase so it is the same and 180° out of phase with respect to that of the second alternating voltage signal;

(c) a phase shifter connected to said second alternating voltage signal generating means for shifting the phase of the second alternating voltage signal by 90°;

(d) a second inverting amplifier connected to said phase shifter for shifting the phase of the 90° phase shifted second alternating voltage signal by 180°;

(e) a second variable resistor connected between the input and output terminals of said second inverting amplifier for adjustably deriving the 90° phase shifted second alternating voltage signal as a voltage with absolute levels ranging from zero to the amplitude of the second alternating voltage signal and which switches in phase so it is the same and 180° out of phase with respect to that of the 90° phase shifted alternating voltage signal; and

(f) an adder connected to said first alternating voltage signal generating means and to the output terminals of said first and second inverting amplifiers for adding the output voltage signal from said first alternating voltage signal generating means to a resultant signal component of the adjusted output signals from said first and second variable resistors to obtain the normal alternating voltage signal when the vehicle is oriented to the predetermined direction.

4. A vehicle orientation detecting device for an automotive or other vehicles, comprising:

(a) means including a rotating conductor for generating a first alternating voltage signal induced when said rotating conductor is rotated so as to intersect the geo-magnetic field;

(b) means for generating a second alternating voltage signal having a period equal to an interval of one turn of said rotating conductor; and

(c) means for adjusting the second alternating voltage signal so as to cancel an erroneous signal component of the first alternating voltage signal derived from said first alternating voltage signal generating means so as to provide a normal alternating voltage signal in accordance with the direction of the geo-magnetic field when the vehicle is oriented to a predetermined direction,

whereby a correct indication of the vehicle orientation can be made on a basis of the phase difference between the normal alternating voltage signal and second alternating voltage signal;

said second alternating voltage signal generating means comprising:

(a) means for generating a rectangular pulse signal having a repetition rate coinciding with an interval of one turn of said rotating conductor; and

(b) means for deriving the second alternating voltage signal in response to the rectangular pulse signal from said rectangular pulse signal generating means so as to be synchronized with the generated rectangular pulse signal.

8. A vehicle orientation detecting device for an automotive vehicle, comprising:

(a) means including a rotating conductor for generating a first alternating voltage signal induced when said rotating conductor is rotated so as to intersect the geo-magnetic field;

(b) means for generating a second alternating voltage signal having a period equal to an interval of one turn of said rotating conductor; and

(c) means for vectorially adjusting the second alternating voltage signal with the vehicle oriented in a predetermined direction;

said adjusting means including:

a first circuit for 180° phase shifting said second alternating voltage signal from the original phase of said second alternating voltage signal to derive a 180° phase-shifted second alternating voltage signal, a phase shifter for shifting the original phase of said second alternating voltage signal by 90°, and a second circuit for 180°

phase shifting said 90° phase-shifted second alternating voltage signal from the phase of the output of said phase shifter to derive a 270° phase-shifted second alternating voltage signal, and

means for controlling the relative amplitudes of the output signals derived by said first and second circuits so they are equal in amplitude and opposite in phase with respect to an erroneous signal component of said first alternating voltage signal;

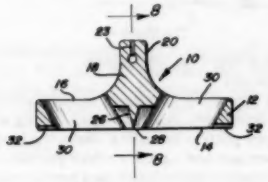
whereby the erroneous signal component of the first alternating voltage signal is cancelled by the resultant of the two signal and the phase of the first alternating voltage signal indicates the true orientation of the vehicle.

4,442,610

MAGNETIC PLUMB BOB HOLDER

George H. Owens, Jr., 2215 Windsor Ave., Montgomery, Ala. 36107

Filed Mar. 24, 1983, Ser. No. 479,863
Int. Cl.³ G01C *15/10*
U.S. Cl. 33—392 7 Claims



1. A plumb line support body having first and second opposite sides, one of said opposite sides including reference plane defining abutment surface means facing outwardly of said one side and lying in a predetermined reference plane, the other of said opposite sides including a central outward projection including line anchoring means for anchoring one end portion of a plumb line thereto in a manner such that the other end portion of the plumb line may extend outwardly and away from said other side along a straight path disposed generally normal to the reference plane, said one side of said body defining an outwardly opening recess therein, said body including projection means projecting outwardly by an inner portion of said recess and including a pointed outer extremity terminating outwardly at least partially adjacent said reference plane and centered relative to said path, said body including window means therein opening through the other side of said body and into said recess for viewing said outer extremity from outwardly of said other side.

4,442,611

AIR LOCK, PARTICULARLY TO PERMIT DRYING OF A PRINTED WEB IN A CONTROLLED ATMOSPHERE

Siegfried Günther, Munich, and Cohann Winterholler, Friedberg, both of Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

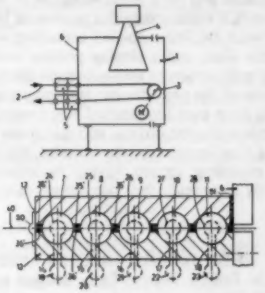
Continuation of Ser. No. 237,576, Feb. 23, 1981, abandoned.
This application Sep. 24, 1982, Ser. No. 422,380
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1980, 3009019
Int. Cl.³ F26B *25/08*
U.S. Cl. 34—41 12 Claims

1. Air lock to separate ambient air from a confined space (1) within a chamber permitting non-contacting movement of a web between the ambient air and the confined space, particularly for movement of freshly printed paper web subject to smearing into and out of said chamber defining the confined space, in which vacuum or gas compositions prevail which differ from ambient atmospheric condition or composition and especially for hardening, curing or drying of printing ink on a paper web,

comprising

two plate elements (12, 13; 32, 33) positioned parallel to each other and spaced from each other to form a web passage slit which is contiguous with a pass-through slit into the chamber, to permit passage of the web through the slit and into the chamber,

each of said plate elements being formed with a plurality of essentially similarly shaped and dimensioned, symmetrical grooves or recesses, or depressions (7–11; 29) extending transversely to the direction of movement of the web, mutually aligned and positioned symmetrically with respect to the pass-through slit into the chamber and located



along the path of travel of the web from outer edges of the plates to the pass-through slit;

and means (14–23) for exclusively providing suction, communicating with the recesses of both of the plates to apply equal suction to the web both from the top as well as the bottom thereof and thereby draw air leaking through said slit into said web passage above the web and below the web;

said plates being sealed laterally of said slit to confine the suction to the slit;

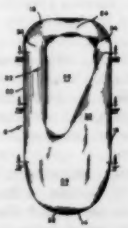
the two plate elements being positioned immediately adjacent the pass-through slit of the chamber, and sealed to the side wall (6) of the chamber to form an air throttle or choke with respect to air communication between the chamber and ambient air.

4,442,612

ORTHOPEDIC PADS

Theodor E. Hauser, Bethel Park, Pa., assignor to Hapad, Inc., Bethel Park, Pa.

Filed Jul. 22, 1982, Ser. No. 400,724
Int. Cl.³ A43B *13/40, 19/00*
U.S. Cl. 36—43 4 Claims



1. A resilient and compressible one-piece generally oblong

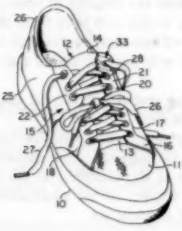
pad adapted to be placed in a shoe and extending from the heel to a position under the longitudinal and metatarsal arches of the foot, said pad comprising a substantially flat bottom surface adapted to contact the inner sole of the shoe, the rear end of said surface being convex arcuate and adapted to closely approach the inside rear of the shoe, the forward end of said surface being relatively straight, longitudinal sides of said flat surface being generally parallel to one another, and convex rounded corners of said flat surface connecting said forward end to said longitudinal sides; a contoured upper surface having a maximum thickness portion, a foward end sloping upwardly and rearwardly to said maximum thickness portion, said maximum thickness portion extending rearwardly across the major portion of the front a distance sufficient to support said metatarsal arch and rearwardly along one longitudinal side a distance and for a width sufficient to support said longitudinal arch, a substantially flat portion of less thickness than the maximum thickness portion extending over the heel portion of the shoe, and a sloping portion extending upwardly from the heel portion to said maximum thickness portion, and the portion of the pad adjacent said longitudinal sides sloping upwardly from each longitudinal side toward the other longitudinal side to the top surface, said maximum thickness portion including a rectangular forward section, and a triangular rearwardly extending section having its hypotenuse extending rearwardly from said other side toward said one side.

4,442,613

SHOE TONGUE HOLDER ASSEMBLY

Thomas M. Dobbin, Denver, Colo., assignor to Kaepa, Inc., San Antonio, Tex.

Filed May 10, 1982, Ser. No. 376,425
Int. Cl.³ A43B *11/00, 23/26*
U.S. Cl. 36—50 **6 Claims**



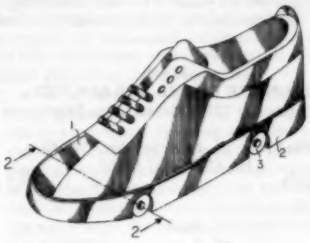
1. A shoe comprising:
(a) a tongue,
(b) a vamp including oppositely disposed upper portions overlying the tongue,
(c) securing means interconnecting the uppers for selectively adjusting the fit of the upper portions over and on the tongue and the fit of the vamp for the comfort of the wearer,
(d) a hook and loop fastener operatively interconnecting the tongue and vamp for holding the tongue in place during fitting and wearing of the shoe,
(e) the tongue including opposed side margins underlying the upper portions of the vamp, one of said margins being selectively operatively interconnected to its overlying vamp upper portion, and the other of said margins being free of operative interconnection to its overlying vamp upper portion, and
(f) the hook and loop fastener including a hook portion and a loop portion, one portion of the hook and loop fastener being fixed to said one of said side margins of the tongue, and said other portion of the hook and loop fastener being fixed to the upper portion of the vamp overlying the said one side margin of the tongue, the said hook and loop portions being selectively alignable and engageable to hold the tongue to the said one upper portion of the vamp.

4,442,614

ARTICLE OF FOOTWEAR

Iosef Farberov, 868 E. 7th St., Brooklyn, N.Y. 11230

Filed Dec. 28, 1981, Ser. No. 334,884
Int. Cl.³ A43B *13/00, 3/28*
U.S. Cl. 36—103 **8 Claims**



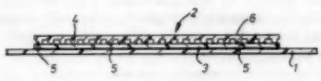
1. An article of footwear, comprising
an upper part; and
a lower part formed as an integral member and connected with said upper part, said lower part having at least one roller-shaped portion extending above the lower surface of said lower part and a groove which partially circumferentially surrounds said roller-shaped portion and separates said roller-shaped portion from a remaining portion of said lower part, wherein said roller-shaped portion and said remaining portion of said lower part are of one piece with one another.

4,442,615

SPORTS FOOTWEAR

Jack Danks, 73 Knowles Rd., Rowley Regis, Warley, West Midlands B 65 8HE, England

Filed Oct. 2, 1981, Ser. No. 307,998
Claims priority, application United Kingdom, Oct. 6, 1980, 8032187
Int. Cl.³ A43B *5/00*
U.S. Cl. 36—133 **12 Claims**



1. A sports boot or shoe having a stippled material secured to at least a portion of the outer surface of the upper of the boot or shoe, with the stippled surface of the material facing inwardly thereof.

4,442,616

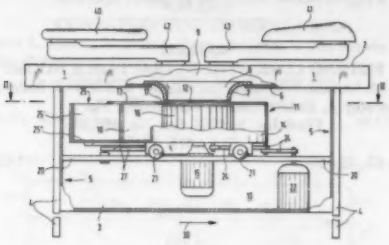
IRONING TABLE WITH A MOVABLE BLOWER UNIT

Georg Hauser, Munich, and Rolf Höggenstaller, Wessling, both of Fed. Rep. of Germany, assignors to J. Strobel & Sohne GmbH & Co., Munich, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,620
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1981, 3146539
Int. Cl.³ D06F *71/34, 81/08*
U.S. Cl. 38—14 **7 Claims**

1. An ironing table provided with a hollow table and a blower arranged under the table, said blower being connected to the table for the selective application applying suction and

blowing air to an ironing surface of the table through an orifice in a bottom section of said table, characterized in that the blower may be displaced between a first position and a second



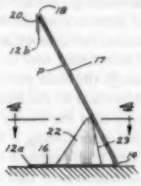
position, in said first position said blower applies suction to said ironing surface through said orifice in said bottom section and in said second position said blower blows air to said ironing surface through said orifice in said bottom section.

4,442,617

PHOTOGRAPHIC PRINT DISPLAY DEVICE

Bruce J. Frye, P.O. Box 783, Milltown, Wis. 54858, and Paul A. Luedtke, Rte. 1, Box 594, Grantsburg, Wis. 54840

Filed Jan. 21, 1983, Ser. No. 459,757
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—152.1 **2 Claims**



1. A unitary self standing device for displaying a photographic print, comprising

a single layer planar blank in plan of a suitable material,

a transverse crease of said blank defining a base portion,

said base portion being angled along said crease at less than a right angle relative to the remaining portion of said blank,

a second transverse crease spaced from the upper edge portion of said blank forming a flap of narrow width,

said flap being angled outwardly relative to the adjacent remaining portion of said blank,

the body portion of said blank being formed between said first and second mentioned creases,

a portion struck from said base portion adjacent said first mentioned crease bendable on an axis at right angles to said first mentioned crease, and

the leading edge of said struck portion being angled to engage and position said body portion at a desirable viewing angle.

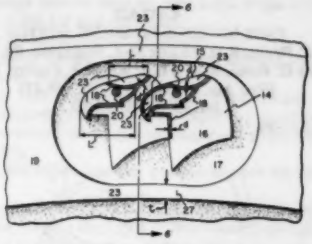
4,442,618

DECORATIVE ORNAMENTATION FOR A RUBBER ARTICLE AND METHOD FOR MAKING SAME

Thomas F. Minter; Lawrence G. Jansen, both of Akron, and Richard H. Springford, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 16, 1982, Ser. No. 349,409
Int. Cl.³ G09F *21/04*; B60C *13/00*
U.S. Cl. 40—587 **14 Claims**

1. An indicium for a rubber article comprising at least one nonlinear narrow groove having a cross-sectional thickness not greater than about 0.152 cm (0.060 inches), a depth of at least 0.102 cm and, a pair of sidewalls disposed at an angle of substantially 90° to the surface of said rubber article, the surface of said indicium being made of a rubber of a first color



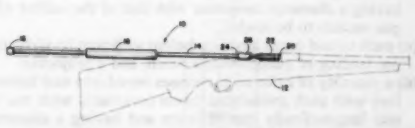
such that said at least one narrow groove is perceived as a narrow line of a contrasting color in said rubber of said first color, said indicium being surrounded by a recessed portion, the surface portion of said recessed portion being made of a rubber having a second color different from said first color.

4,442,619

CARTRIDGE EXTRACTION TOOL

Roy J. McCarley, Red Eagle Rte., Box 68, Pawhuska, Okla. 74056

Filed Dec. 21, 1981, Ser. No. 332,960
Int. Cl.³ F41C *27/00*; B25B *27/00*
U.S. Cl. 42—1 R **3 Claims**



1. A cartridge extraction tool adapted to remove a live round of amnunition struck in the barrel of a breech loading bolt action firearm comprising:

(a) a rod with an end cap;

(b) a movable knocker circumferentially displaced about said rod and adapted to manually slide on said rod and strike said end cap thus creating an extraction force longitudinal to said rod;

(c) a compressible fastening means for circumferentially fitting over the rim of a stuck cartridge when in the uncompressed state and under compression closing and gripping a stuck cartridge wherein said compressible fastening means is attached at the other end of said rod and is an externally threaded cylindrical surface that terminates in a hollow right frustro-conical surface with the larger end directed away from said threads and rod, and wherein said frustro-conical surface contains a plurality of cuts longitudinal to the direction of the rod such as to allow for compression of said frustro-conical surface, and wherein the outer segmented edge of said longitudinally cut frustro-conical surface contains a segmented circumferential ledge directed into the hollow interior of said frusto-conical surface such as to close around and grip the rim of a stuck cartridge when compressed; and

(d) a means for compressing said compressible fastening means wherein said means for compressing said frustro-conical surface consists of (i) an internally threaded member circumferentially engaged to said external threaded cylindrical surface such that when threaded towards said larger end moves a cylindrical concentric member surrounding said first frustro-conical surface and (ii) a cylin-

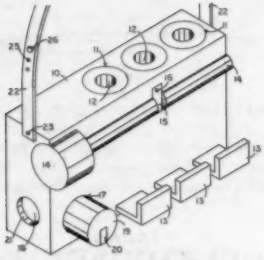
drical concentric member surrounding said first frustro-conical surface having an interior second frustro-coincal surface engaged to said first frustro-conical surface such that said compression takes place.

4,442,620

FAST MUZZLE-LOADING DEVICE

Stephen C. Drake, R.D. #3 Box 38-A, Slatington, Pa. 18080, and Richard G. Bosse, R.D. 2 Box 386-6AA, Coplay, Pa. 18037

Filed Apr. 5, 1982, Ser. No. 366,375
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—90 4 Claims



1. A self-contained loading device for loading muzzle-loading firearms, comprising:

(a) an elongated block having a top face, a bottom face and a vertical dimension;

(b) a plurality of longitudinally spaced, cylindrical bores, extending vertically through said block, each of said bores having a diameter consistent with that of the caliber of a gun muzzle to be loaded;

(c) each of said bores having a height sufficient to allow the pre-loading of gunpowder, a patch, and a projectile;

(d) a plurality of cylindrical recesses bored into said bottom face with each cylindrical recess concentric with one of said longitudinally spaced bores and having a diameter consistent with that of the outside diameter of said gun muzzle to be loaded; and

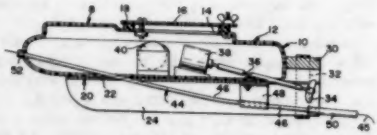
(e) a plurality of circular indentations on said top face, each circular indentation being concentrically located around one of said longitudinal bores and having a diameter consistent with the diameter of a patch for centering the patch over the longitudinal bore.

4,442,621

SELF-PROPELLED TROLLER

John E. Kent, #A-3, 900 Siskiyou Blvd., Medford, Oreg. 97501

Filed Apr. 21, 1982, Ser. No. 370,538
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—26.1 9 Claims



1. A self-propelled troller comprising

an elongate flotation hull having bow and stern ends,

a powered propeller mounted adjacent the stern end of said hull for propelling the hull in a forward direction in water, and

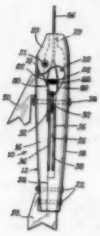
an elongate tube mounted on said hull, having one end adjacent the bow end of said hull and the tube extending from said one end to an opposite end disposed rearwardly of and below said propeller, said tube being adapted slidably to receive a fishing line and serving to position the fishing line where it first extends from said opposite end in a region below where the propeller operates.

4,442,622

FISHING LURE WITH RETRACTABLE HOOKS

Don M. Sartain, Wabasso, Fla., assignor to Robert T. Esdale and Dorothy A. Esdale, both of Vero Beach, Fla.

Filed Jan. 3, 1983, Ser. No. 455,205
Int. Cl.³ A01K *83/02*
U.S. Cl. 43—35 1 Claim



1. A fishing gear comprising,

a plug made up of a pair of parts fitted together in side-by-side relation and simulating a fish in size and shape,

one of the parts constituting a bottom part and extending the full length of and determining the length of the plug, and having a head portion extending the depth of the plug, and having a hole of substantial size leading rearwardly from the front end through the head portion, and having a front cavity element at the rear of the head portion and the hole opening rearwardly into the cavity element,

the other of the parts constituting a top part, and fitted on the bottom part, and the two parts being dimensioned and shaped in depth direction such that when they are so fitted together, they form therebetween a rear cavity element of relatively flat shape and of less depth than the front cavity element, and the two cavity elements intercommunicating and forming a common cavity opening sideways to the exterior throughout its length,

a pair of fishhooks in the cavity, and means mounting them therein, the mounting means including a pin mounted in the plug parts and extending through the cavity and serving to secure the plug parts together at least at that position, the fishhooks each including a washer pivotally mounted on the pin, a main shank element and a hook element at one end and a second shank element at the other end, the shank elements being secured to the washer, the fishhooks being movable between a collapsed position in which they are substantially entirely within the cavity and an extended position in which the hook elements are positioned on the exterior, the second shank elements being in the front cavity element in both positions of the fishhooks,

the fishing gear also including a compression spring between the second shank elements operable for normally moving the fishhooks to collapsed position, and

a line element having branches connected respectively with the front ends of the second shank elements and leading forwardly through said hole, and adapted for connection to a fish line,

the construction being operable, in response to a bite by a fish and effectively pulling rearwardly on the plug, and correspondingly producing a relatively forward reaction on the line, for effecting the swinging movement of the fishhooks to their extended position,

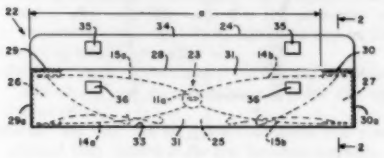
the plug also including means securing the plug parts together at the rear end of the plug.

4,442,623

CONTAINER FOR UMBRELLA RIG

Robert L. Hawie, Stratford, Conn., assignor to The Hawie Mfg. Co., Bridgeport, Conn.

Filed Sep. 22, 1982, Ser. No. 421,292
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—54.1 **19 Claims**



1. A retainer-container for an umbrella rig having a central support and four flexible wire arms extending radially therefrom at angles of 90° relative to each other, adjacent pairs of said arms being capable of being flexed together so that the extremities thereof are parallel to each other, said retainer-container comprising a narrow, elongate container section which is sufficiently long to receive an umbrella rig in flexed condition and which comprises an elongate fabric panel having opposed transverse spaced retainer means attached to said fabric panel, each of said transverse retainer means having an entrance which is open to the center of said container section, whereby a pair of adjacent wire arms of an umbrella rig can be flexed together and inserted into said container section and into the entrance of one of said retainer means for confinement therein in flexed condition and the other pair of adjacent wire arms can be flexed together and inserted into said container section and into the entrance of the other said retainer means for confinement therein in flexed condition to contain and retain said umbrella rig in said narrow elongate container section.

4,442,624

METHOD AND APPARATUS FOR FORMING A COLLAPSIBLE TRAP FOR FLYING INSECTS

Lloyd E. Browne, Easton, Pa., assignor to J. T. Baker Chemical Co., Phillipsburg, N.J.

Filed Dec. 18, 1981, Ser. No. 332,009
Int. Cl.³ A01M *1/10*
U.S. Cl. 43—107 **24 Claims**

1. The method of forming a collapsible trap for flying insects comprising the steps of:

providing a plurality of panels hinged at their lateral edges to adjacent panels along respective hinge lines for enabling said hinged panels to be collapsed into a flat configuration with said panels in face-to-face contact for convenience in shipping and storing,

providing an entrance port for flying insects in at least one of said panels,

forming the trap enclosure by orienting said panels around said hinge lines to form the side walls of the enclosure,

forming a top for said enclosure,

forming a bottom for said enclosure,

to each panel having an entrance port affixing a shade flap above the respective port,

orienting each such shade flap in a downward outward inclination with respect to the respective panel to provide a downwardly outwardly sloping shade above the respective port,

bending the lower free end portion of each flap inwardly, and

inserting the free end portion of each flap into the respective port for holding the flap in its downwardly and outwardly sloping position forming a shade above the port.

4,442,625

TAPE-SUPPORTED SLEEPER YO-YO

Patrick MacCarthy, 37 Mines Park, Golden, Colo. 80401

Continuation-in-part of Ser. No. 138,729, Apr. 9, 1980, Pat. No. 4,290,224. This application Sep. 2, 1981, Ser. No. 298,720
Int. Cl.³ A63H *27/12*
U.S. Cl. 46—61 **15 Claims**

1. A toy capable of combined rotational motion about a horizontal axis and translational motion in a vertical direction, comprising:

an axle;

a first disc connected at a center point to said axle;

a second disc connected at a center point to said axle;

a string connected at a first end to said axle at a position between said first disc and said second disc;

a torsionally resistant tape connected to a second end of said string.

4,442,626

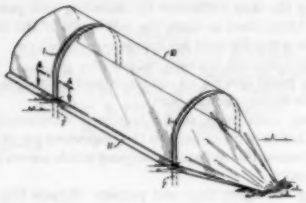
CLOCHES

Errol C. Hammond, Auckland, New Zealand, assignor to Kerilea International Limited, Auckland, New Zealand

Filed Aug. 12, 1981, Ser. No. 292,174
Claims priority, application New Zealand, Aug. 15, 1980, 194678
Int. Cl.³ A01G *13/04*; A45F *1/16*
U.S. Cl. 47—29 **7 Claims**

1. A cloche frame comprising a substantially U-shaped non-tubular support and a securing means, said support being formed from a flat strip and having substantially M-shaped cross-section, the top of the M being outwardly facing to provide a channel on the outer surface of the support, the free ends of the support each having an attachment means provided in the channel on the outer surface of the support; said securing

means being adapted to be engaged within the channel in order to secure a covering in the channel and being substantially



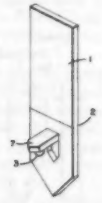
U-shaped when engaged within the channel, the free ends of the securing means being adapted for attachment to the attachment means of the support.

4,442,627

SEED PLANTING DEVICE

James E. Adams, Billericay, and Alexander S. Laurie, Royston, both of England, assignors to Wilkinson Sword Limited, England

PCT No. PCT/GB81/00031, 371 Date Sep. 25, 1981, 102(e) Date Sep. 25, 1981, PCT Pub. No. WO81/02503, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 2, 1981, Ser. No. 306,915
Int. Cl.³ A01C 1/04
U.S. Cl. 47—56 7 Claims



1. A seed planting device of the type comprising a flat strip insertable into the ground and carrying thereon one or more seeds, wherein the seed(s) is/are adhesively secured on the underside of a tongue projecting from one face of the strip and lying at an angle to the plane thereof.

4,442,628

ROOT-PRUNING CONTAINER

Carl E. Whitcomb, Stillwater, Okla., assignor to Board of Regents for Oklahoma Agricultural & Mechanical Colleges Acting for Oklahoma State University, Stillwater, Okla.

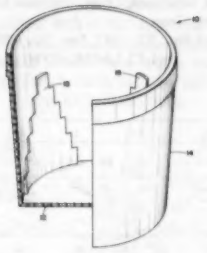
Filed Apr. 20, 1983, Ser. No. 486,985
Int. Cl.³ A01G 31/00
U.S. Cl. 47—66 5 Claims

1. A container adapted to contain a growing medium and a plant comprising:

(a) a bottom wall;

(b) a circumferentially upwardly extending sidewall attached to the perimeter of said bottom wall thus forming an open-topped container: and

(c) at least one root pruning means comprising an inner sidewall segment essentially parallel to said circumferentially upwardly extending sidewall and displaced to the inside of said open-topped container wherein the perimeter of said inner sidewall segment is a plurality of vertical and horizontal intersecting edges proceeding from the bottom of said container to the top of said inner sidewall segment on both sides of said inner sidewall segment thus forming a pyramid like series of steps and wherein the vertical and horizontal edges of said pyramid like series of steps are connected to said circumferentially upwardly



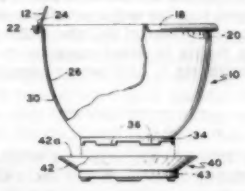
extending sidewall by essentially flat surfaces that recede behind said inner sidewall segment at an acute angle to said circumferential upwardly extending sidewall, thus forming root-pruning traps at the toe position of each of said steps.

4,442,629

EASILY ASSEMBLED COMBINATION FLOWER POT AND TRAY

Dennis C. Anderson, Northfield, Minn., assignor to National Polymers Inc., Lakeville, Minn.

Filed Jul. 6, 1982, Ser. No. 395,681
Int. Cl.³ A01G 9/02
U.S. Cl. 47—71 16 Claims



1. An easily assembled combination flower pot and water collection tray both formed from semiflexible plastic resinous material comprising,

a flower pot body of one piece construction having side and bottom walls,

a water collection tray of one piece construction including bottom and side walls,

at least one drain hole in the flower pot body to allow excess water in the pot to drain into and collect in the tray,

one of said bottom walls having a lug retaining opening at the center thereof with an integral retaining means at the edge of the opening,

the other of said bottom walls including a unitary centrally located vertically extending hollow lug integral with said other bottom wall and having a free end projecting in the direction of the opening in said one bottom wall,

said lug having an end portion engageable within said opening and being generally conical in configuration,

said free end being of reduced cross-section compared with the rest of the lug,

said end portion of the lug terminating in a circular enlarged section,

said lug having a base and a circular groove located between the base and the enlarged section,

the free end of said lug being closed and non-deflectable and

said lug having a yieldable hollow central wall region that is deflectable radially inward,

said retaining means forming a releasable snap fit connection over said generally conical end portion of the lug as the central wall region and enlarged section is deflected radially inwardly when the tray is pressed toward the body of the flower pot to retain them together,

said combination flower pot and tray including at least two locating means to held center the tray at the bottom of the pot including:

(a) said side wall of the tray and the side wall of the pot being positioned in proximity with respect to one another after assembly such that the proximity of the respective side walls help to center the tray on the pot during manual assembly,

(b) the reduced cross-section at the free end of the lug and said conical end portion helping to guide the lug into the opening,

whereby the tray can be quickly centered and properly oriented with respect to the pot for rapid assembly.

4,442,630

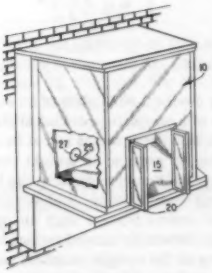
DOOR CONTROL

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Continuation-in-part of Ser. No. 78,095, Sep. 24, 1979, abandoned, and Ser. No. 179,961, Aug. 20, 1980, Pat. No. 4,411,102. This application Feb. 18, 1982, Ser. No. 349,711

Int. Cl.³ E05C *7/06*

U.S. Cl. 49—115 **14 Claims**



1. In combination with an inclosure having a passage therein and a pair of swinging doors closing said passage, said doors having opposed vertical hinges and substantially meeting edges when closed, and means for simultaneously opening and closing said doors comprising,

a. straight line reciprocable means actuable by human muscular force to open the doors,

b. a fixed member carried by the inclosure and slidably mounting said reciprocable means,

c. a cam follower carried by said reciprocable means,

d. a crank arm pivoted at one end and having a cam at the opposite end in engagement with said cam follower,

e. mechanical transmission means extending between said pivoted end of said crank arm and said doors for opening the latter, and

f. energy storing means operable automatically to close the doors when force is withdrawn from the reciprocable means.

4,442,631

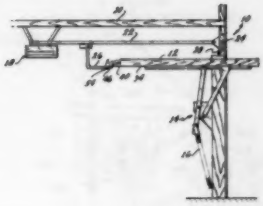
LOCK FOR GARAGE DOOR EQUIPPED WITH AUTOMATIC GARAGE DOOR OPENER

Harvey L. Weber, 123 W. Wilken Way, Anaheim, Calif. 92802

Filed Jun. 18, 1982, Ser. No. 389,714

Int. Cl.³ E05F *11/00*

U.S. Cl. 49—199 **12 Claims**



1. In combination with an automatic garage door opener used for opening and closing a garage door a locking device which comprises:

a housing means attaching to said garage door;

a bracket means attaching to the garage with which said garage door is associated, said bracket means attaching to said garage and said housing attaching to said garage door in positions such that when said garage is closed said housing means and said bracket means are located in association with one another;

an element rotatably mounted on said housing to rotate on said housing between an unlocked position and a locked position, sad automatic garage door opener directly attaching to said element and capable of moving said element betwen its unlocked and its locked position, said automatic garage door opener further capable of moving said garage door by imparting motion to said garage door, said motion imparted to said garage door for both opening and closing said garage door by said automatic garage door opener interacting with said element which in turn interacts with said housing which in turn interacts with said garage door;

said element in moving from its unlocked position to its locked position when said garage door is closed capable of engaging with said bracket means to lock said garage door against opening said garage door by an outside influence and when said garage door is in its closed position and said element moves from its locked position to its unlocked position said element disengaging from said bracket means allowing said garage door to be opened by said automatic garage door opener;

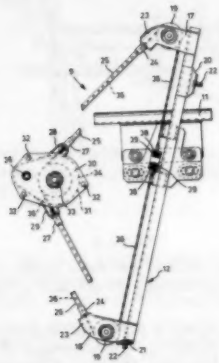
element positioning means associated with said element and capable of holding said element in both its unlocked and locked position, said element positioning means interactng with said element such that when said garage door is open and said element is in its unlocked position movement imparted to said element and said garage door by said automatic garage door opener moves said garage door from its open to its closed position and when said garage door is in its closed position subsequently moves said element from its unlocked to its locked position engaging said element with said bracket means and when said garage door is closed and said element is in its locked position engaged with said bracket means movement imparted to said garage door by said automatic garage door opener first moves said element from its locked position to its unlocked position disengaging said element from said bracket means and subsequently moves said garage door from its closed to its open position.

4,442,632

WINDOW REGULATOR, PARTICULARLY FOR MOTOR VEHICLES

Claudio Greco, Rivoli, and Gianfranco Fiorito, Nichelino, both of Italy, assignors to IAO Industrie Riunite S.p.A., Italy

Filed Dec. 3, 1981, Ser. No. 327,048
Int. Cl.³ E05F *11/48*
U.S. Cl. 49—352 **6 Claims**



1. A regulator for controlling the raising and lowering movement of a window within the door of a motor vehicle within a channel along one margin of a window opening of the vehicle, said regulator including a rigid guide affixed to said door adjacent said window opening and substantially parallel to said channel, a flexible drive cable linearly movable along a path generally parallel to said guide and externally thereof for raising and lowering said window, a first slide member secured to said window for movement therewith, a second slide member resiliently secured to said cable and tracked to said guide for movement therealong under control of said cable, said second slide member constrained to linear motion along said guide and means for connecting said first and second slide members to couple said members together for movement of said window in response to movement of the cable, said connecting means enabling a controlled amount of transverse movement between said slide members during raising and lowering movement of said window, means confining transverse movement to a direction generally transverse to the direction of said channel, and means coupling said second slide member to said guide to allow hinge motion of the member about the guide.

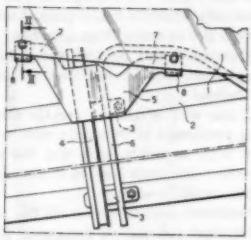
4,442,633

SUPPORTING DEVICE FOR THE VERTICALLY MOVABLE WINDOW PANEL OF A MOTOR-VEHICLE WINDOW

Giovanni Gianotti, Beinasco, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Jul. 13, 1982, Ser. No. 397,725
Claims priority, application Italy, Jul. 22, 1981, 68015 A/81
Int. Cl.³ E05F *11/00*
U.S. Cl. 49—375 **2 Claims**

1. A supporting device for a vertically movable window panel of a motor vehicle window, said device comprising a guide element intended to be mounted on the motor vehicle, a slide member slidably mounted on said guide element and arranged to carry the said window panel, and a pair of support elements for supporting the window panel on said slide member, said support elements being mounted on the slide member for sliding movement in a direction substantially perpendicular to the direction of sliding of the slide member on the said guide element, and each said support element being provided with a



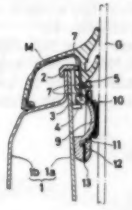
resiliently deformable lug snap engageable in a corresponding hole in the window panel.

4,442,634

RETAINER DEVICE FOR CAR WIND-UP WINDOW

Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan

Filed Apr. 5, 1983, Ser. No. 482,354
Claims priority, application Japan, Apr. 6, 1982, 57-48812[U]
Int. Cl.³ E06B *7/16*
U.S. Cl. 49—493 **3 Claims**



1. A retainer device for the glass of an automobile window which consists of a baseplate provided at the upper part of its outer surface with a fixing means and at its inner surface with an inward facing lip portion; an upright member at the inner edge of the lip portion in opposition to the baseplate to clamp a waist molding therebetween, said upright member being provided in its central portion with an opening; a support member with an outwardly curved surface which is located in the said opening of the upright member; and a fabric portion provided on its surface with a flock portion and replaceably set on the outer surface of the said support member; the said retainer device being attached so as to urge the said flock portion against the outer surface of the glass of a vertically openable window.

4,442,635

SHARPENER FOR INDUSTRIAL KNIFE BLADES

Leward N. Smith, Milbrook at Coldwater Rd., Remus, Mich. 49430

Continuation of Ser. No. 79,353, Sep. 27, 1979, Pat. No. 4,313,283. This application Aug. 31, 1981, Ser. No. 297,930
Int. Cl.³ B24B *3/55, 7/02*
U.S. Cl. 51—56 R **31 Claims**

1. In a sharpener for machinery knife blades, the improvement comprising:

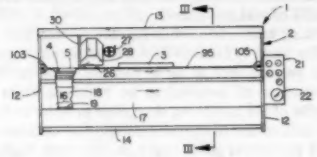
a frame having a grinder head with an abrasive element mounted thereon;

an elongate bracket having means for retaining a knife blade

with a cutting edge in a predetermined relationship with respect to said abrasive element;

means for translating said grinder head with said abrasive element along a plane generally parallel to a knife blade; and

means for mounting said elongated bracket to said frame, and including means for adjusting the position of one end of said elongated bracket with respect to the other end of



said bracket to align a knife blade held thereby with the translation plane of said grinder head, said adjusting means comprising at least three threaded studs, threadedly mounted in three associated tabs which project inwardly from an end portion of said frame, and are arranged in a spaced apart relationship thereon; said studs having inwardly directed terminal ends which form a socket in which said one bracket end is received, and abuttingly and adjustably supported.

4,442,636

DUAL HEAD EDGE SHARPENING DEVICE FOR SKIS

Donald R. Obland, 6750 S. Clermont St., Littleton, Colo. 80122

Filed Jan. 22, 1982, Ser. No. 341,837

Int. Cl.³ B24B *9/02*

U.S. Cl. 51—205 WG **15 Claims**

1. An edge sharpening device for snow skis and the like comprising:

a support that is adjustable in length having oppositely extending end support portions;

a pair of edge sharpening heads supported by said end support portions for reciprocal movement along opposite sides of a ski, each said head having a side sharpening face for engaging an adjacent side surface of a metal edge strip and a bottom sharpening face for engaging an adjacent bottom face of a metal edge strip, said heads being flexibly mounted on said end support portions to enable said side sharpening faces to turn from side to side to follow the taper of a metal edge strip of a ski of varying width; and

biasing means associated with said support for enabling said edge sharpening heads to be spread apart and then be brought closer together to position said heads on the ski for edge sharpening and for simultaneously urging said heads toward one another and against adjacent side surfaces of the pair of metal edge strips on the ski.

4,442,637

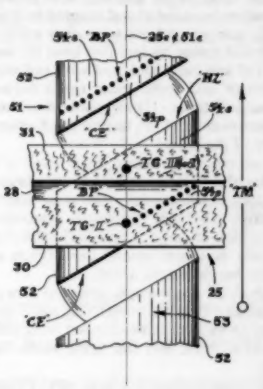
SIMULTANEOUS DOUBLE-ACTING SPLIT ABRASIVE WHEEL FOR PERIPHERAL SHARPENING OF HELIX TOOLS AND USE THEREOF

Alexander Abejew, 5082 E. Holland Rd., Saginaw, Mich. 48601

Continuation of Ser. No. 24,380, Mar. 27, 1979, abandoned, which is a continuation-in-part of Ser. No. 864,005, Dec. 30, 1977, abandoned. This application Aug. 25, 1981, Ser. No. 296,030

Int. Cl.³ B24B *3/24, 5/00*

U.S. Cl. 51—288 **50 Claims**



1. A double-banded, split abrasive wheel for the sharpening by abrading grind dressing of helix tools,

said wheel being characterized in its unique adaptability and capability of accomplishing in a single, simultaneously-performable, one-pass operation to impart completely in the peripheral surface of teeth flight(s) of the tool being sharpened the appropriate desired primary relief surface both as to width and angulation from the intended cutting edge of the tool and the appropriate desired secondary clearance surface leading to the heel of the tooth profile and broken away from and more highly angulated than said primary relief surface;

said wheel comprising as an apparatus combination:

(a) a generally circular central support member having a round peripheral edge that is spaced from and coaxial with the central axis center line of rotation of the wheel;

(b) a pair of constantly-layered, continuously-uninterrupted, equally- and uniformly-thick, abrasive bands split so as to be substantially disproportionate in width and mounted side-by-side on the peripheral edge of said central support member (a) and coaxial with said axial center line of said support member;

each of the bands in said pair (b) of abrasive bands having essentially the same abrading hardness; so that

(c) each of said pair of abrasive bands (b) has an exposed, continuous and integral effectively at least about equivalent grinding surface face thereon relevant to grind dressing capability;

(d) each of said pair of abrasive bands (b) having an independently and distinct uniform width, the determining side edges of which limit the grinding face(s) (c) thereof; with

(e) the grinding surface face (c) of each of said abrasive bands (b) being distendingly disposed with a lay in the same line passing generally in crossing traverse contact and running across said respective and aligned faces of both bands;

(f) a gap of softer material including the material of said central support member (a) separating and uniformly spacing said pair of split abrasive bands (b) between one of the laterally-extending width edges (d) thereof of each of

said pair in the mounted placement position of said bands about central support member (a);

(g) the width of the first one of said bands in said pair (b) which for application of forward shank-to-nose tool feeding to be sharpened with said wheel is intended and adapted to initially contact and form the cutting edge and provide material removal for primary relief from and into the tooth projection(s) of of a helix tool being passed into contact for its sharpening by means of said wheel being relatively wider than

(h) the width of the relatively narrower second one of said bands in said pair (b) which, also in forward tool-feeding application, is intended and adapted to immediately subsequently contact and cut secondary relief and angulation after initial action by said first band on said tooth projection(s) of said helix tool; and with and wherein

the width of said wider band (g) is between about one-and-one-half-times (1½) and about four-times (4×) that of said narrower band (h); so that as a further characterizing feature of the wheel

the rate of wear experienced as a result of abrading grind dressing sharpening action by said abrasive wheel on a helix tool is substantially the same insofar as concerns respective thickness reductions encountered after any given period of usage in both said wider band (g) and said relatively narrower second band (g) in said pair (b) of abrasive bands in said wheel.

36. Method of single-stage, one-step sharpening of helix tools, including end mills, comprising the Step of:

(1) taking an unground, pre-formed helix tool having a nose end and a shank end and spiral tooth flight(s) therebetween;

(2) slowly twist-feeding said helix tool by rotating it about its center line axis of rotation and passing it longitudinally by and laterally against the aapparatus combination,

said wheel being a double-banded, split abrasive wheel for the sharpening by abrading grind dressing of helix tools and which is characterized in its unique adaptability and capability of accomplishing in a single, simultaneously-performable, one-pass operation to impart completely in the peripheral surface of teeth flight(s) of the tool being sharpened the appropriate desired primary relief surface both as to width and angulation from the intended cutting edge of the tool and the appropriate desired secondary clearance surface leading to the heel of the tooth profile and broken away from and more highly angulated than said primary relief surface, said wheel being comprised of:

(a) a generally circular central support member having a round peripheral edge that is spaced from and coaxial with the central axis center line of rotation of the wheel;

(b) a pair of constantly-layered, continuously-uninterrupted, equally- and uniformly-thick, abrasive bands substantially disproportionate in width and mounted side-by-side on the peripheral edge of said central support member (a) and coaxial with said axial center line of said support member;

(c) each of said pair of abrasive bands (b) having an exposed, continuous and integral effectively at least about equivalent grinding surface face thereon relevant to grind dressing capability;

(d) each of said pair of abrasive bands (b) having an independently and distinct uniform width, the determining side edges of which limit the grinding face(s) (c) thereof;

(e) the grinding face (c) of each of said abrasive band (b) distendingly disposed with a lay in the same line passing generally in crossing traverse contact over and running across said respective and aligned faces of both bands;

(f) a gap of softer material including the material of said central support member (a) separating and uniformly spacing said pair of split abrasive bands (b) between one of the laterally-extending width edges (d) thereof of each of said pair in the mounted placement position of said bands about said central support member (a);

(g) the width of the first one of said bands in said pair (b) which for application of forward shank-to-nose tool feeding to be sharpened with said wheel is intended and adapted to initially contact and form the cutting edge and provide material removal for primary relief from and into the tooth projection(s) of a helix tool being passed into contact for its sharpening by means of said wheel being relatively wider than

(h) the width of the relatively narrower second one of said bands in said pair (b) which, also in forward tool-feeding application, is intended and adapted to immediately subsequently contact and cut secondary relief and angulation after initial action by said first band on said tooth projection(s) of said helix tool;

(3) setting said wheel with respect to said tool so that its wider band (g) makes first cutting contact contact with said passing tool so as to initially excavate the greater proportion of material to be removed from the tooth profile of the tool being sharpened in order to form at least the bulk of one of the peripheral relief surfaces and associated peripheral relief angle on the tooth flight(s) of said tool; and so that after which in immediate subsequent sequence

(4) said narrower band (h) setting of said wheel is such that it makes following cutting contact taking a lesser proportion of remaining tooth profile material in excavation to complete the peripheral relief surfaces and associated peripheral relief angle on said tooth flight(s); during which time there is carried out

(5) rapid, power-driven, grinding rotation of said wheel; then

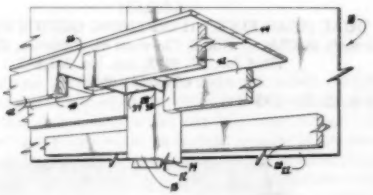
(6) withdrawing the thereby completely dressed and finished tool from grinding contact with said wheel.

4,442,638

SHELF BRACKET

Luke C. Hamilton, R.R. #1 - Box 77, Bancroft, Iowa 50517

Filed Jun. 21, 1982, Ser. No. 390,786
Int. Cl.³ E04G *3/00*
U.S. Cl. 52—36 **3 Claims**



1. The combination of a building wall comprised of a plurality of poles rectangular in cross-section and having two opposite sides, and an inner face and an outer face, parallel horizontal spaced stringers extending between said poles, and skin material secured to and extending over said stringers and being in close spaced relation to the inner faces of said poles and being separated therefrom by the width of said stringers, and a shelf structure, comprising, a shelf bracket secured to at least two of said poles,

said shelf brackets each including a pair of spaced parallel arms having inner and outer ends and being adapted to embrace the sides of the respective poles upon which they are mounted,

a fixed cross member extending laterally between said arms and being located away from the inner ends of said arms to engage the outer faces of said rectangular poles,

a fastening means detachably secured to said arms and extending between said arms at the inner ends thereof adjacent the inner face of said poles and extending through a narrow space between the inner face of said poles and said skin material as defined by the thickness of said stringers,

a pair of sockets on each of said arms adapted to receive the ends of second stringers to support a shelf surface, second

stringers received in the adjacent sockets of adjacent shelf brackets,

and a shelf surface secured to said second stringers.

4,442,639

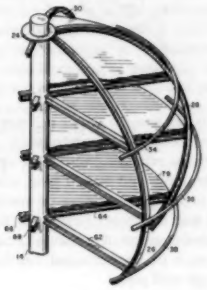
BUILDING STRUCTURE METHOD

Stanley D. Lindsey; Socrates A. Ioannides; Jack R. Horner, all of 3716 Hillsboro Rd., Nashville, Tenn. 37215; William S. Denton, 1317 Bales Dr., Morristown, Tenn. 37814; Donald P. Shell, 8904 Ripon Cir., Knoxville, Tenn. 37923, and Hubert Bebb, Rte. 3, Buckhorn Rd., Gatlinburg, Tenn. 37738

Filed Nov. 27, 1981, Ser. No. 325,506

Int. Cl.³ E04B *1/32*

U.S. Cl. 52—73 9 Claims



1. A building having a shape wherein horizontal cross-sections of the building define a circle, said building comprising:

a base;

a vertical core structure, said core structure being fixedly and permanently attached to said base and extending vertically to a top end;

a circular tension ring fixedly attached to said vertical core structure proximate said top end of said vertical core structure;

a circular compression ring fixedly attached to said vertical core structure at a location below said tension ring;

a multiplicity of curved meridian members attached to and extending between said tension ring and said compression ring, said multiplicity of meridian members having a single selected shape and being substantially uniformly spaced around said tension ring and said compression ring;

a multiplicity of radial members extending horizontally between and attached to said core structure and said curved meridian members; and

a multiplicity of horizontal circular hoop members attached to said multiplicity of meridian members at selected vertical locations between said tension ring and said compression ring, each of said circular hoop members surrounding said core structure, said meridian members and said circular hoop members defining a three dimensional building structure wherein a horizontal cross-section taken at any selected vertical location through said building structure defines a circle.

4,442,640

METHOD OF CONVERTING A ROOF FRAME AND FRAME ELEMENTS FOR PERFORMING THIS METHOD

Jean-Pierre Gary, Z. I. du Fort, rue de haut de la Cruppe, 59650 Villeneuve d'Ascq, France

Filed Mar. 25, 1983, Ser. No. 478,844

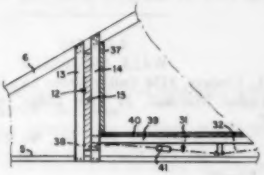
Int. Cl.³ E04B *7/04*

U.S. Cl. 52—90 9 Claims

1. A method of converting a roof frame bearing the roofing of a construction having at least two gable walls and two facade walls, the frame being located between two gable walls and comprising a plurality of trusses spaced from one another and extending from one facade wall to another, on which walls the trusses bear, each truss comprising a horizontal tie-beam and two inclined principal rafters which are connected to one another by triangulation elements supporting the principal rafters in order to enable them to resist the bending stress to which they are subjected owing to the load of the roofing, the method comprising the following steps:

(a) fixing a vertical channel between each of the principal rafters and the tie-beam of at least a plurality of the trusses;

(b) bringing into the roof and engaging in the channels, beams which have previously been divided into a plurality of sections, the ends of the beams bearing on the gable walls;



(c) connecting the sections of each beam together by connection means;

(d) securing a king post below each of the said connection means;

(e) engaging the base of each king post with two ties whose other ends are connected at least indirectly to the ends of the beam sections located either side of the king post in question, and

(f) stressing the ties so that, owing to their reaction on the king posts with which they form triangulations, they support the beams, which themselves support the principal rafters and the roofing at least indirectly, thereby enabling the initial triangulation of the trusses to be removed and subsequently the roof to be fitted out.

4,442,641

VERGE MEMBER FOR A PITCHED ROOF AND ROOFING SYSTEM INCORPORATING THE SAME

Geoffrey C. Quinnell, Pembury, England, assignor to Marley Tile A.G., Switzerland

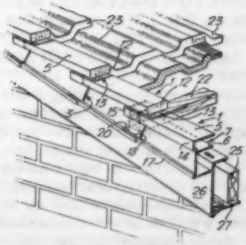
PCT No. PCT/GB80/00205, 371 Date Jul. 28, 1981, 102(e) Date Jul. 28, 1981, PCT Pub. No. WO81/01583, PCT Pub. Date Jun. 11, 1981

PCT Filed Nov. 28, 1980, Ser. No. 287,567

Claims priority, application United Kingdom, Oct. 28, 1979, 7940986

Int. Cl.³ E04D *13/15*

U.S. Cl. 52—94 9 Claims



9. A roof system comprising: a plurality of longitudinally overlapping and laterally engaged tiles (24) adjacent the verge

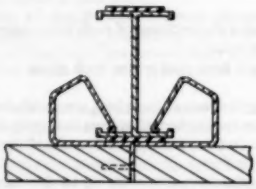
of the roof and verge members (1) capping the tiles having a longitudinally extending planar portion (2) tapering in height from one end (3) of the member to the other (4), a first flange (5) substantially normal to said planar portion and extending along the upper edge thereof, a second flange (6) substantially normal to said planar portion and extending therealong, said second flange being spaced from said first flange and defining therewith a channel (7) of substantially constant height receiving the edge of a tile, a protruding element (14) extending along said planar portion adjacent the upper edge thereof on the side remote from said flanges, there being defined between said element and the face of the planar portion a space (16) at least equal to the thickness of said planar portion, said space extending along the planar portion from the shorter end thereof, said verge members being telescopically engaged with their taller ends (3) facing down the roof.

4,442,642

WALL ASSEMBLY

Robert L. Lindner, 3154 Valley Green La., Napa, Calif. 94558, and Luther Marshall, 21 View Ridge Dr., Novato,, Calif. 94947

Filed Mar. 27, 1981, Ser. No. 248,397
Int. Cl.³ E04B *1/00*; E06B *3/54*
U.S. Cl. 52—98 **5 Claims**



1. In a wall assembly: a study having a flat flange; a wall panel having a side margin; and a spring clip carried by the side margin of the wall panel and having a resilient part provided with an outer marginal edge movable into engagement with one face of the flange of the stud when the wall panel is adjacent to the opposite face of the flange for releasably mounting the wall panel on the study, said resilient part having a resilience permitting the wall panel to move generally horizontally toward the stud when the stud is vertical until the resilient part has yielded and moved about one outer extremity of the flange and then has sprung back to cause said outer marginal edge to engage said one face of the flange to releasably connect the clip to the flange, said resilient part having breaking means permitting it to be breakable from the reminder of the clip to separate said clip remainder from the flange when the wall panel is moved away from the stud.

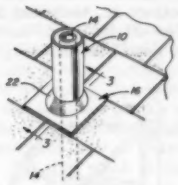
4,442,643

VENT PIPE INSULATING SLEEVE

James S. Stadheim, R.R. 2, Watertown, S. Dak. 57201

Filed Apr. 23, 1981, Ser. No. 256,776
Int. Cl.³ E04F *17/04*; E04D *13/14*
U.S. Cl. 52—219 **4 Claims**

1. In combination with an upstanding sewer vent pipe projecting upwardly through a roof structure and terminating upwardly a spaced distance above the portion of the roof structure through which said vent pipe projects, said vent pipe being subject to upward flow of high humidity air and sewer gas therethrough and a build up of accumulated ice thereacross as a result of condensation and ice build up within said upper end portion during periods of very cold ambient temperature, an insulation sleeve assembly for preventing said build up solely through utilization and prevention of loss of the inherent heat of vented high humidity sewer gas, said assembly including an outer sleeve of waterproof material, an inner sleeve body of heat insulative material snugly received within, extending the full length of and supported from said outer sleeve, the upper end of said outer sleeve including an annular upper end portion lapped over the upper end of said inner sleeve body, said sleeve assembly being snugly telescoped over substantially the entire upper end portion of said vent pipe projecting above said roof structure with said inner sleeve at least substantially filling annular area defined between the outer surfaces of said pipe and the inner surfaces of said outer sleeve,



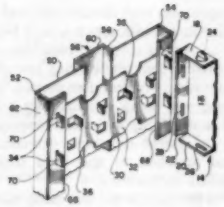
said outer sleeve and annular upper end portion being of nonmetallic low heat conductive construction, said sleeve assembly being of portions extending across the upper end thereof in registry with the upper end of said pipe, whereby there exists no obstruction to the gentle egress of vented gases from the pipe upper end and maximum heating of the pipe upper end and minimum condensation of moisture occurs within the pipe upper end as result of unobstructed venting of sewer gases upwardly through said pipe.

4,442,644

FRAME MEMBER FOR USE WITH CONSTRUCTION BLOCKS

Christoher E. Jukes, Vancouver, Canada, assignor to Mod-Lok Industries, Ltd., Vancouver, Canada

Filed Jun. 22, 1981, Ser. No. 276,077
Int. Cl.³ E06B *1/04*
U.S. Cl. 52—213 **6 Claims**



1. A frame member for use with a plurality of consumable modular building blocks to form an opening therein, said blocks being stacked in courses forming a wall of a building structure and each block includes a pair of side plates and a pair of transverse spacer members at each end of said plates spacing one plate from the other to create a block of rectangular configuration, and adapted to receive concrete therein, each side plate having top edges including spaced apart upward lug projections and lower edges including corresponding slots, and each side having end edges including slots, said frame member including:

a pair of upright structural column jambs, each including a face plate portion having exterior edge walls with a stop projection extending therefrom the length of each of said column jambs and spaced between said exterior edge walls thereof, and said column jambs at each of said exterior edge walls bent inwardly therefrom forming flanges spaced from said face plate portion generally parallel with

said face plate portion and extending toward each other, and a plurality of slots formed through each flange;

a header member extending between said upright structural column jambs and united thereto, said header member having a cross sectional configuration similar to said jambs including slots formed through said flanges and with the stop projection aligned with said stop projections of said jambs;

said column jambs and said header member positioned in said wall whereby the flanges of said column jambs abut the end edges of said building blocks of various courses and the flanges of said header abuts said lower edges of a plurality of blocks forming a course above said header; and

tie means to unite said column jambs, and said header member with said blocks whereby said combination of wall and frame member are fixed to each other; said tie means for said header is a clip member of a thickness adapted to extend through said slots and is generally T shaped and the leg of said T extends through adjacent aligned slots of said header and said block and the top of said T is longer than said slots and said leg of said T is bent whereby the members are locked one to the other.

4,442,645

CONSTRUCTION PANEL FOR DOUBLE FLOORS IN AIR CONDITIONED ROOMS

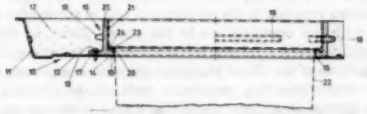
Wolfgang Hiller, Karlstadt/Laudenbach, and Hans Kramer, Mainbernheim, both of Fed. Rep. of Germany, assignors to MERO-Werke Dr.-Ing. Max Mengeringhausen GmbH & Co., Wurzburg, Fed. Rep. of Germany

Filed Nov. 5, 1980, Ser. No. 204,352

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1979, 2944842

Int. Cl.³ E04D *29/14*

U.S. Cl. 52—221 **3 Claims**



1. An overhanging compound construction panel for double floors used in room air conditioning, the panel having an external, tub-shaped sheathing means made of a high tensile-strength and high Young's modulus material, said sheathing means having an upper portion and a bottom with an aperture therein, and a filler means introduced in said tub-shaped sheathing means when in the flowing or pourable state and of a low tensile-strength and low Young's modulus, characterized by at least one rigid annular body (16) fixed in said aperture (14) to the bottom (13) of the tub-shaped sheathing means (11) in essentially hermetically sealing relation therewith and anchored in the filler means (12), said annular body (16) having a lower portion and extending up to the upper portion of the sheathing means and being provided with a radially inwardly projecting annular flange (20) at the lower portion thereof for supporting an air discharge nozzle (21) within said annular body and a dirt-catcher (22) beneath said nozzle (21), said annular body (16) comprising an inner wall (25), and said annular flange (20) having an upper portion (23) that is separated from said inner wall (25) by an annular groove (24).

4,442,646

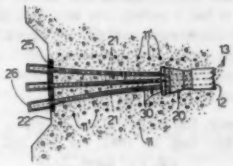
DEVICE FOR ANCHORING TENSIONING ELEMENTS

Cesare Prevedini, Milan, Italy, assignor to Ponteggi Est S.p.A., Italy

Continuation of Ser. No. 201,570, Oct. 28, 1980, abandoned. This application Jul. 13, 1983, Ser. No. 512,949

Int. Cl.³ E04C *5/12*

U.S. Cl. 52—230 **2 Claims**



1. A device for anchoring a plurality of tensioning strands to a structure, which device comprises:

(a) a box encasing intermediate portions of the strands therein;

(b) a plate spaced from the box for securing the free ends of the strands and distributing tension loading;

(c) corrugated sheaths extending from the plate to the box, each sheath encasing a strand, each sheath being filled with epoxy resin for embedding the strand therein and spacing same from adjacent strands, said sheath being embedded in concrete;

(d) the box including a packing of epoxy resin embedding the portions of the strands contained therein and avoiding load peaks in the transition area where strands depart from the box.

4,442,647

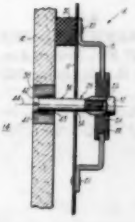
SOUNDPROOFING PANEL MOUNTED TO EFFECT VIBRATION ISOLATION

Eric G. Olsen, Woodbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 6, 1982, Ser. No. 395,166

Int. Cl.³ E04B *1/62*

U.S. Cl. 52—393 **3 Claims**



1. In combination:

a vibration prone wall member,

a rigid soundproofing panel adapted to be supported in spaced relation to said wall,

means to support said soundproofing panel from said wall while providing vibration isolation therebetween comprising:

elastomeric gasket means extending between said wall and said rigid soundproofing panel and extending throughout the full periphery of said panel, yet to prevent acoustic flanking between the wall and the panel,

an attachment bracket member attached to said wall,

an elastic plate isolator supported from an aperture in the said center of said bracket member so as to extend substantially parallel to said wall and being of selected

spring rate to tune the support means so that minimal wall vibration is imparted therethrough to said panel,

a connecting member extending through aligned apertures in said wall and said soundproofing panel and connected to said plate isolator so as to support said soundproofing panel from said wall through said bracket member and said plate isolator, and being of selected length when in installed condition to selectively compress said elastomeric gasket means to a thickness at which it has a spring rate less than the plate isolator spring rate so as not to affect support means tuning.

4,442,648

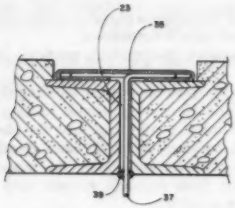
CONCRETE PANEL

Chester A. Reece, 100 Bexhill Ct., Greenville, S.C. 29609

Filed Aug. 14, 1981, Ser. No. 292,786

Int. Cl.³ E04C *1/34*

U.S. Cl. 52—468 **10 Claims**



1. A generally rectangular concrete panel comprising;

a concrete body portion;

a pair of curved edge defining members along each lateral edge of said panel, said edge defining member being curved such that the distance between the outer edges of said edge defining members are a maximum at the upper and lower extents of said panel and a mimimum at the mid-portion of said panel; and

wherein said concrete body portion has substantially straight parallel edges with a width less than said minimum distance between said edge defining members.

4,442,649

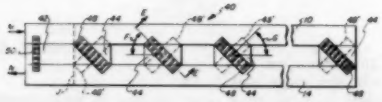
FABRICATED BEAM

Robert Birckhead, 3127 SW. Natura Ave., Deerfield Beach, Fla. 33441, and William R. McAlpine, 9451 NW. 40th St., Coral Springs, Fla. 33065

Filed Oct. 18, 1982, Ser. No. 434,962

Int. Cl.³ E04C *3/02*; E04H *12/06*

U.S. Cl. 52—693 **6 Claims**



1. A fabricated beam for use in building construction or the like, said beam comprising:

at least two longitudinal wooden members generally parallel and spaced apart from one another;

a plurality of wooden spacer blocks, each spacer block of said plurality of said spacer blocks positioned between and along the length of said at least two longitudinal wooden members;

a plurality of pairs of metal truss plates formed from sheet metal stock and having formed nail portions extending perpendicularly from one side of the plane of said truss plates;

each of said pair of truss plate nail portions forcibly urged into two adjacent said at least two longitudinal members and into a different said spacer block;

the longitudinal axes of each truss plate of each said pair of truss plates intersecting over a said different spacer block into which said pair of truss plate nail portions is said forcibly urged;

said longitudinal axes of each truss plate of said pair of truss plates forming an acute angle with the longitudinal axis of said beam.

4,442,650

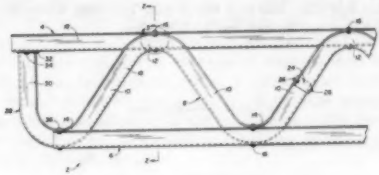
GIRDER CONSTRUCTION

Eugene W. Sivachenko, 6471 Riverside Dr., Redding, Calif. 96001

Filed Dec. 15, 1977, Ser. No. 860,798

Int. Cl.³ E04C *3/02*

U.S. Cl. 52—694 **4 Claims**



1. A high strength, relatively lightweight girder comprising a substantially rigid upper chord plate and a substantially rigid, spaced apart, parallel lower chord plate, the chord plates being constructed of corrugated plate, the corrugations of one chord plate being in substantial alignment with the corrugations of the other chord plate, the corrugations further having a generally trapezoidal cross-section, a corrugation pitch of at least about 16 inches and a corrugation depth of at leat about 5 inches; a substantially rigid connecting member disposed between the chord plates and defining a plurality of serially arranged diagonal webs and curved crown sections interconnecting the webs, the connecting member further defining corrugations extending over the substantially full length of the connecting member in the direction of and in substantial alignment with the corrugations in the chord plates so that the corrugations of the connecting member nest in corresponding corrugations of the chord plates; an end plate at each end of the girder interconnecting proximate ends of the chord plates; bosses formed in at least one of the chord plate and the connecting member establishing metal-to-metal contact between the chord plates and the crown sections; and means securing the crown sections in the area of the bosses to the chord plates and for connecting the end plates to corresponding ends of the chord plates.

4,442,651

PROCEDURE AND ARRANGEMENT FOR LAYING THE FOUNDATION OF PREFABRICATED PLANTS ASHORE

Carl Cappé, Stockholm, Sweden, assignor to NYA Asfalt AB, Stockholm, Sweden

PCT No. PCT/SE80/00022, 371 Date Oct. 3, 1980, 102(e) Date Oct. 3, 1980, PCT Pub. No. WO80/01581, PCT Pub. Date Aug. 7, 1980

PCT Filed Jan. 24, 1980, Ser. No. 261,234

Claims priority, application Sweden, Feb. 5, 1979, 7900955

Int. Cl.³ E04G *21/00*

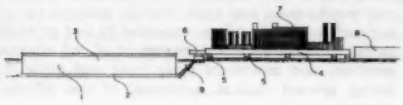
U.S. Cl. 52—745 **2 Claims**

1. A method of erecting, transporting and installing a building structure comprising the steps of:

(a) erecting a building structure on a foundation member of

the type having smooth undersurfaces for moving the foundation member with the building structure thereon in sliding contact with the sliding surfaces on a floating barge,

(b) sliding the foundation with the building structure thereon on said sliding surfaces on said floating barge from longi-



tudinal sliding means on land until the foundation is carried fully on said floating barge, then,

(c) transporting said barge to a site, and

(d) unloading said foundation by sliding the smooth surfaces of the foundation off said sliding surfaces of said floating barge to longitudinal sliding means at the site.

4,442,652

APPARATUS FOR AUTOMATICALLY PACKING END CLOSURES FOR CANS IN PAPER BAGS

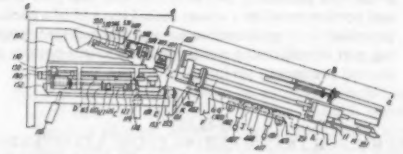
Atsuyuki Wakamatsu, Shimizu, and Haruo Tsuwano, Shizuoka, both of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Division of Ser. No. 204,622, Nov. 6, 1980, which is a continuation of Ser. No. 37,694, May 10, 1979, Pat. No. 4,251,977. This application May 20, 1983, Ser. No. 496,594

Claims priority, application Japan, Feb. 24, 1979, 54-21190

Int. Cl.³ B65B *35/42, 35/48, 43/34, 57/20*

U.S. Cl. 53—258 **6 Claims**



1. Apparatus for loading a stack of items into an elongate bag having an open end comprising:

(a) a tubular guide;

(b) means for inserting said guide endwise, into said bag;

(c) means for temporarily retaining the bag to maintain the portion of the bag adjacent the open end thereof in surrounding relation with said guide;

(d) means for positioning the stack of items in alignment with said guide;

(e) an elongated push rod;

(f) means for moving the push rod endwise into the guide so that the push rod forces the stack of items into the bag until the leading end of said push rod protrudes beyond the end of said guide within said bag, said moving means also being operative to temporarily retain said push rod in such protruding disposition so that the push rod bears on the stack of items within the bag to prevent dislocation of items within the stack;

(g) means for withdrawing said push rod through said guide; and

(h) means for pinching and thus partially closing the bag adjacent said open end concomitantly with withdrawal of the push rod so that the walls of the bag engage the stack of items and prevent dislocation of items within the stack upon withdrawal of the push rod.

4,442,653

MACHINE FOR FILLING BOTTLES AND CANS

Friedrich Rademacher, Kamen-Suedkamen, Fed. Rep. of Germany, assignor to Holstein & Kappert GmbH, Dortmund, Fed. Rep. of Germany

Filed Sep. 18, 1981, Ser. No. 303,713

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044597

Int. Cl.³ B65B *43/52*

U.S. Cl. 53—266 R **3 Claims**

1. An arrangement for guiding containers, like bottles and cans between a filling machine and a respectively associated closing machine, wherein the bottles of the filling are fed from a starwheel directly to the associated closing machine along a feed path, the arrangement comprising:

an endless feed chain for guiding the cans along a further feed path to the other associated closing machine, the feed chain extending between the starwheel and the other closing machine around horizontally extending axes spaced from each other and being arranged laterally to the feed path of the bottles so as to cooperate with each can fed from the filling machine in case the cans are to be filled and not to intefere with the bottles fed from the filling machine in case the bottles are to be filled, wherein the feed chain includes a plurality of fingers engageable behind the cans in such a manner that in direction of the further feed path the fingers of the feed chain are arranged to engage in an upstream position behind one side of the cans at a laterally offset position to the center line of the further feed path and in a downstream direction to engage behind the other side of the cans at a laterally offset position to the center line of the further feed path.

4,442,654

APPARATUS FOR AUTOMATICALLY PACKING END CLOSURES FOR CANS IN PAPER BAGS

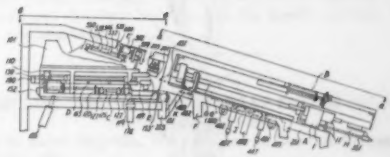
Atsuyuki Wakamatsu, Shimizu, and Haruo Tsuwano, Shizuoka, both of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Division of Ser. No. 204,622, Nov. 6, 1980, which is a continuation of Ser. No. 37,694, May 10, 1979, Pat. No. 4,251,977. This application May 20, 1983, Ser. No. 496,592

Claims priority, application Japan, Feb. 24, 1979, 54-21190

Int. Cl.³ B65B *35/42, 35/48, 43/34, 57/20*

U.S. Cl. 53—266 R **2 Claims**



1. Apparatus for loading a stack of items into an elongate bag having an open end comprising:

(a) a tubular guide;

(b) means for inserting said guide endwise, into said bag;

(c) means for temporarily retaining the bag to maintain the portion of the bag adjacent the open end thereof in surrounding relation with said guide;

(d) means for positioning the stack of items in alignment with said guide;

(e) an elongated push rod;

(f) means for moving the push rod endwise into the guide so that the push rod forces the stack of items into the bag until the leading end of said push rod protrudes beyond the end of said guide within said bag, said moving means also being operative to temporarily retain said push rod in such protruding disposition so that the push rod bears on

the stack of items within the bag to prevent dislocation of items within the stack;

(g) means for withdrawing said push rod through said guide;

(h) means for pinching and thus partially closing the bag adjacent said open end concomitantly with withdrawal of the push rod so that the walls of the bag engage the stack of items and prevent dislocation of items within the stack upon withdrawal of the push rod; and

(i) means for twisting the bag about its axis while the bag is engaged by said pinching means to further close the bag and thus tighten the walls of the bag against the items contained therein.

4,442,655

FIBRINOGEN-CONTAINING DRY PREPARATION, MANUFACTURE AND USE THEREOF

Michael Stroetmann, Münster, Fed. Rep. of Germany, assignor to Serapharm Michael Stroetmann, Münster, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,215

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124962; Jun. 25, 1981, 3124933; Aug. 12, 1981, 3131827; European Pat. Off., Dec. 18, 1981, 81110615; May 26, 1982, 82104606

Int. Cl.[3] **A61K** *9/14, 35/14, 37/00*

U.S. Cl. 53—428 **18 Claims**

1. Fibrinogen-containing dry preparation having a foam-like and fleece-like structure, especially adapted for use as a wound toilet material, filling material for bone cavities, and/or supporting material for further active substances, consisting essentially of thrombin in an at least catalytically active amount, about 10 to 95% by weight of fibrin, and about 5 to 90% by weight of fibrinogen.

4,442,656

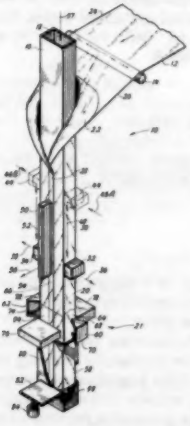
FILLING AND SEALING MACHINE FOR PROVIDING A FLAT BOTTOM PACKAGE

James C. Wylie, Sr., Houston, Tex., assignor to Universal Packaging, Inc., Houston, Tex.

Filed Oct. 26, 1981, Ser. No. 314,658

Int. Cl.[3] **B65B** *9/08, 51/30*

U.S. Cl. 53—552 **6 Claims**



1. A filling machine for forming a package from a continuous roll of heat sealable pliable material and for sealing and separating said filled package from said continuous roll of material comprising:

a hollow guide form having a top and bottom end and a selected cross-sectional shape;

means for forming pliable sealable material from a continuous roll around said guide form to form a continuous seamed packaging preform having said selected cross-sectional shape;

a pair of opposed advancing members intermediate said top and bottom ends of said guide form for advancing said preform such that a portion of said preform extends below said bottom end of said guide form, said advancing members adapted for simultaneous vertical movement and movement toward said guide form for grasping the exterior surface of said preform supported by said guide form during downward vertical movement of said advancing members, and movement away from said guide form during upward vertical movement of said advancing members;

a pair of opposing and horizontally movable tucking jaws located proximate said bottom end of said guide form such that said portion of said preform extending below said bottom end of said guide form passes therebetween, each of said tucking jaws including a pair of pointed extension members separated a selected vertical distance, and each of said pointed extension members of said tucking jaws suitable for contacting and partially collapsing said preform extending below said guide form to form a tuck in opposite sides of said preform when said tucking jaws are moved toward each other;

a pair of opposing and horizontally movable sealing jaws located proximate said bottom end of said guide form and said tucking jaws such that said portion of said preform extending below said guide-form passes therebetween, said sealing jaws suitable for collapsing said preform and providing a seal portion of a selected width across said preform by moving said sealing jaws toward each other and between said pointed extension members of said tucking jaws; and

means for cutting through said continuous packaging preform at said seal portion to separate said seal portion into a first and remaining part such that said first part of said seal portion provides a square sealed top end of a package separated from said continuous preform and said remaining part of said sealed portion forms a sealed bottom end on said continuous preform.

4,442,657

DEVICE FOR TRANSFERRING FROM A CONVEYING BELT, GOODS SUCH AS BUT NOT EXCLUSIVELY, BISCUITS

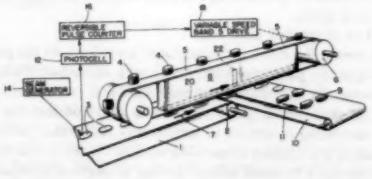
Roger Busseniers, Brussels, and Martial Deudon, Sint-Kruis-Brugge, both of Belgium, assignors to N.V. Biscuits Delacre S.A., Belgium

Filed Jun. 23, 1981, Ser. No. 276,707

Claims priority, application Belgium, Jun. 27, 1980, 0/201216

Int. Cl.[3] **B65G** *43/00, 47/00;* **B65B** *25/16*

U.S. Cl. 53—500 **10 Claims**



1. Device for transferring goods such as but not exclusively, biscuits from a conveying band whereon said goods are so laid down that the spacing between said goods may vary within some determined limits, whereby said transferring can occur along the direction of one or a plurality of conveying tracks and the device comprises means to grip said goods on said conveying band and lay said goods down on one of said con-

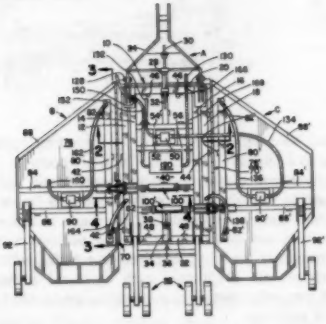
veying tracks, generally into containers or boxes present on said conveying track or tracks, in which said goods are caught on the conveying band by gripping members fastened to an endless conveying band, said endless conveying band moving substantially in that plane where said conveying band moves and actually at least over such a distance which is long enough to bring a gripping member above a piece of goods to be gripped and to grip said piece of goods, whereby means are provided to sense the position of said piece of goods or of an apparatus cooperating with the passage of such a piece of goods, and according to said position of the piece of goods or apparatus, to bring said gripping member above the sensed piece of goods.

4,442,658

TRAILING WING MOWER

Jack O. Cartner, 1005 N. Eighth St., Cambridge, Ohio 43725

Filed May 12, 1982, Ser. No. 377,347
Int. Cl.³ A01D *69/00*
U.S. Cl. 56—11.9 **14 Claims**



11. A trailing wing mower comprising:

a. a central rotary mower section including:

(i) a central section deck;

(ii) a combined frame and heat exchanger including at least first and second side tubular channel members disposed adjacent opposite sides of the central section deck, front and rear tubular channel members disposed adjacent the front and rear of the central section deck, the first side, the second side, the front, and the rear tubular channel members being structurally and fluidically interconnected;

(iii) spacing means for fixedly connecting the central section deck to, below and spaced from the tubular members and thereby forming a structural supportive intersection between said deck and said tubular members such that the passage of air between the tubular members and the central section deck is substantially uninhibited, whereby cooling air is able to flow around the tubular members to facilitate the exchange of heat;

(iv) a first hydraulic motor mounted adjacent the central section deck;

(v) a cutting blade mounted below the central section deck and operatively connected with the first hydraulic motor to be driven thereby;

(vi) support means for supporting the central section for movement along the ground;

b. a wing rotary mower section pivotally mounted to the central section and including:

(i) a first wing deck;

(ii) a second hydraulic motor mounted adjacent the wing deck;

(iii) a second cutting blade mounted below the first wing deck and operatively connected with the second hydraulic motor to be driven thereby; and

c. a hydraulic system including:

(i) pump means operatively connected with the first and second hydraulic motors and with the tubular members for pumping hydraulic fluid to the hydraulic motors;

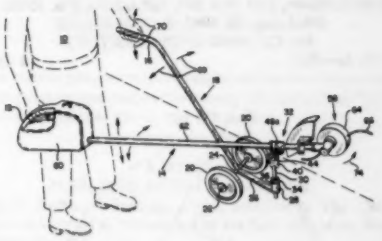
(ii) return line means for returning hydraulic fluid from the hydraulic motors to the first and second paths of the tubular members.

4,442,659

DOLLY FOR LAWN TRIMMER AND COMBINATION THEREOF

Henry J. Enbusk, Rt. 1, Box 1151, Clatskanie, Oreg. 97016

Filed Aug. 26, 1982, Ser. No. 411,667
Int. Cl.³ A01G *3/06*
U.S. Cl. 56—12.7 **11 Claims**



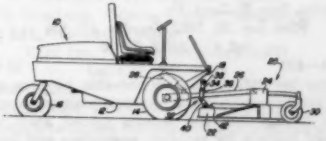
1. A support dolly for a trimmer for trimming and edging operations that includes a trimmer head adapted to be maneuvered in suspended relation to the ground, a handle adapted to be gripped by an operator while in a standing position, and a shaft connecting the handle and the trimmer head; said support dolly comprising: at least one wheel, a dolly frame, mounting means to mount the dolly frame to the wheel, and a bracket assembly carried by the dolly frame and adapted to mount the trimmer to the dolly frame; said dolly frame including a support member extending forward of the wheel and a handle member including a handle extending rearward and upward of the wheel being supported on the ground; and said bracket assembly including a bracket adapted for connection to the shaft of the trimmer, and a pivotal coupling means coupling the bracket to the support member forwardly of the wheel, said coupling means providing free horizontal pivoting of the bracket and free pivotal swinging of the trimmer carried thereby during trimming and edging operations whereby the operator can simultaneously control the handles of both the dolly and trimmer.

4,442,660

HIGH LIFT MECHANISM FOR REAR END OF FRONT MOUNTED MOWER

John B. Kuhn, Mayville, Wis., assignor to Deere & Company, Moline, Ill.

Filed Aug. 30, 1982, Ser. No. 412,733
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—15.9 **3 Claims**



1. In a vehicle having a rotary mower mounted thereon by at least one lift arm extending between a frame of the vehicle and a central location between front and rear ends of a blade

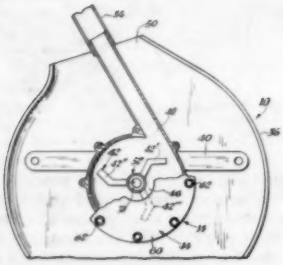
housing of the mower, a lift mechanism for effecting elevation of the rear end of the blade housing in response to upward movement of the lift arm, comprising: a first link pivoted medially of its ends to the lift arm at a location above the rear end of the blade housing; surface means at one end of the first link being disposed beneath and closely adjacent to a surface of said frame when the lift arm is in a lowered position; and a second link having its opposite ends respectively pivotally connected to a second end of the first link and the rear end of the housing whereby raising of the lift arm will cause the one end of the first link to engage the frame surface so as to impart rotation to the first link and effect lifting of the rear end of the housing.

4,442,661

LAWN MOWER PUMP

Clifford H. Stuart, P.O. Box 367, Indiantown, Fla. 33456

Filed Aug. 30, 1982, Ser. No. 412,642
Int. Cl.³ A01D *35/26*; F03B *11/02*
U.S. Cl. 56—16.9 **4 Claims**



1. A rotary blade lawn mower pump movable on wheels from place to place comprising:

a rotary blade lawn mower including a mower housing with usable rotatable wheels connected to said housing;

a motor connected to said housing, said motor including a drive shaft means driven by and connected to said motor, said drive shaft means having a connecting portion, said drive shaft means extending outward to said connecting portion;

an impeller pump including a pump cover, an impeller freely rotatable in said pump cover, and a pump support, said pump support connected to said pump cover and removably connected to said mower housing, said impeller connected to said connecting portion of said drive shaft, said pump cover including an inlet opening and a discharge outlet, whereby said rotary blade lawn mower pump is easily movable from place to place on said usable rotatable wheels to pump out large areas of water of a relatively shallow depth.

4,442,662

METHOD AND APPARATUS FOR CONVERTING A HARVESTING MACHINE BETWEEN OPERATING AND TRANSPORT POSITIONS

Richard E. Jennings, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 30, 1982, Ser. No. 431,521
Int. Cl.³ A01B *73/00*
U.S. Cl. 56—228 **20 Claims**

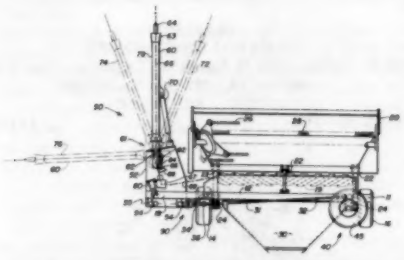
1. A crop harvesting machine movable between a crop harvesting position and a lateral transport position comprising:

a frame having first and second spaced apart wheels mounted thereon for mobilely supporting said frame on the ground;

a crop harvesting header mounted on said frame to harvest crop adjacent said ground, said header having harvesting means generally horizontally disposed adjacent the ground when in said harvesting position to engage crop material and initiate the crop harvesting process;

draft means connected to said frame and adapted for connection to a prime mover to move said header over the ground, said draft means having a hitch base pivotally connected to said frame along a pivot axis and a tongue pivotally connected at one end to said hitch base and adapted at an opposing end for connection to said prime mover, said first wheel being disposed adjacent said hitch base;

first power means interconnecting said tongue and said hitch base to selectively pivotally move said tongue relative to



said hitch base between a forwardly extending operating position to a laterally extending transport position;

second power means interconnecting said frame and said hitch base to selectively pivotally move said frame relative to said hitch base about said pivot axis to move said machine between said crop harvesting position and said lateral transport position, said header rotating with said frame about said pivot axis such that said harvesting means is generally vertically oriented when in said lateral transport position;

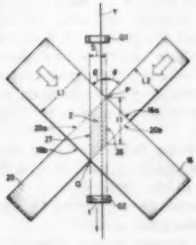
wheel means mounted on said frame to engage said ground to mobilely support said frame when in said lateral transport position.

4,442,663

BELT-OPERATED FALSE-TWISTING UNIT

Noboru Shindo, Shiga, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 10, 1982, Ser. No. 448,496
Claims priority, application Japan, Dec. 11, 1981, 56-200375
Int. Cl.³ D01H *7/92*; D02G *1/06*
U.S. Cl. 57—336 **4 Claims**



1. A belt-operated false-twisting unit comprising two endless belts extending across each other and drivable to run in opposite directions at the intersection for nipping a yarn between the two belts to false-twist the yarn, characterized in that a yarn nipping portion comprises a parallelogrammatic region which is included in the intersecting area of the endless belts

and is defined by two straight lines passing through points of intersection of the side edges of the belts and parallel to a line passing through the centers of yarn passage holes of yarn guides arranged at both sides of the intersecting area along the path of travel of the yarn.

4,442,664

FALSE-TWIST APPARATUS

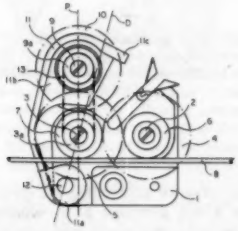
Günther Schmitt; Günter Oppl, both of Hammelburg, and Kirit Patel, Elfershausen, all of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed May 28, 1982, Ser. No. 383,174

Claims priority, application Fed. Rep. of Germany, May 30, 1981, 3121614

Int. Cl.³ D02G 1/04

U.S. Cl. 57—339 6 Claims



1. A false-twist device comprising:

a support;

a pair of spindles fixedly positioned on said support but rotatable about respective parallel axes thereof;

a further swingable spindle having an axis parallel to the first mentioned axes and spaced therefrom whereby said axes define the vertices of a triangle;

a first belt for driving at least one of said fixedly positioned spindles;

a second belt, separate from said first belt, connecting said one of said fixedly positioned spindles and said swingable spindle, all of said spindles having friction discs interdigitating or overlapping in a closed position of said swingable spindle and wherein a yarn can be inserted among said discs in an open position of said swingable spindle; and

means for pivotally mounting said swingable spindle to enable the angular displacement thereof between said positions about a pivot axis offset from the vertices of said triangle.

4,442,665

COAL GASIFICATION POWER GENERATION PLANT

Bruce R. Fick, Ballston Lake, and Robert M. Jones, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 17, 1980, Ser. No. 198,059

Int. Cl.³ F02C 3/28

U.S. Cl. 60—39.12 31 Claims

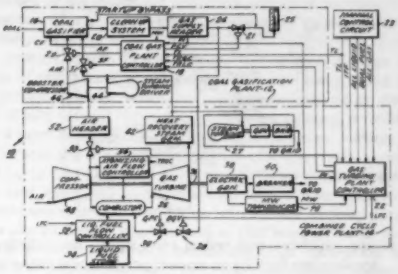
1. A power plant, comprising:

a coal gasification plant;

said coal gasification plant being effective to produce a gas pressure of coal gas;

a gas turbine effective to burn at least said coal gas and to produce an output power in response thereto;

a coal gas plant controller responsive to a selectable one of said gas pressure and said output power for controlling feed of materials to said coal gasification plant, said coal gasification plant producing said gas pressure in response to said feed of materials; and



a gas turbine plant controller responsive to the other of said gas pressure and said output power for controlling feed of at least said coal gas to said gas turbine.

4,442,666

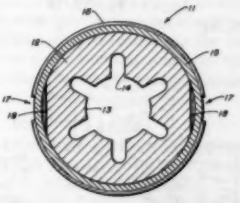
FUEL FIRE RESISTANT MOTOR

Ronald F. Vetter, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 21, 1982, Ser. No. 435,819

Int. Cl.³ F02K 9/00

U.S. Cl. 60—39.47 6 Claims



1. A rocket motor comprising:

a metallic outer casing;

a cylindrical propellant grain within said metallic outer casing having a longitudinal central bore having radial grooves extending radially outward from said bore;

an insulating layer disposed about the outer surface of said metallic casing a having a plurality of gaps in said layer preferably positioned to overlie the spaces between said radial grooves; and

insulating material between said outer casing and said cylindrical propellant grain located adjacent said gaps.

4,442,667

ACCELERATION LIMIT RESET

Bernard D. MacIsaac, Ottawa, Canada, assignor to Aviation Electric Ltd., Montreal, Canada

Filed Jan. 14, 1981, Ser. No. 224,978

Int. Cl.³ F02C 9/28

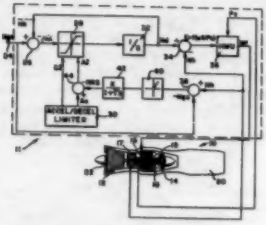
U.S. Cl. 60—39.281 8 Claims

1. An acceleration limit reset means for a fuel control of a gas turbine engine during thermal transient conditions including means for generating an acceleration limit, said reset means charactized by:

means for generating a deceleration signal proportional to the deceleration of the engine;

means, receiving said deceleration signal, for generating a

reslam reset signal proportional to said deceleration signal; and



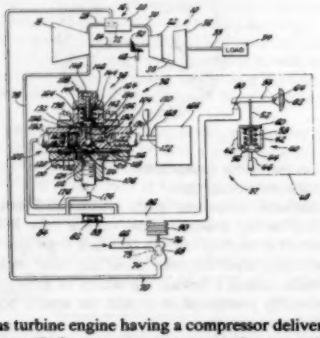
means, receiving said reslam reset signal, for reducing the acceleration limit by an amount proportional to the reslam reset signal.

4,442,668

GAS TURBINE ENGINE FUEL CONTROL SYSTEM

Francis E. Conn, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1982, Ser. No. 362,494
Int. Cl.³ F02C 9/28
U.S. Cl. 60—39.281 **5 Claims**



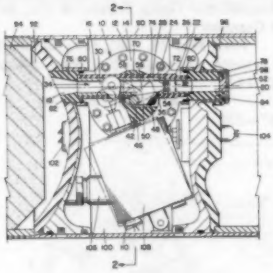
1. In a gas turbine engine having a compressor delivering air at compressor discharge pressure to a combustor and a fuel control system including fuel valve means operative to meter fuel to said combustor in proportion to the magnitude of a control pressure and governor means connected to said fuel valve means operative in a first mode to regulate a supply of air at said compressor discharge pressure down to said control pressure and in a second mode to cause said control pressure to increase toward said compressor discharge pressure at a plurality of rates, the improvement comprising, valve means connected to said governor means operative independently of said governor means during said second mode to regulate said control pressure at a maximum pressure difference below said compressor discharge pressure, and feedback means connected to said valve means operative during said second mode to reduce said maximum pressure difference at a preselected rate so that said control pressure approaches said compressor discharge pressure at said preselected rate.

4,442,669

NOZZLE/VALVE DEVICE FOR A DUCTED ROCKET MOTOR

William M. Burkes, Jr., and William H. Miller, both of McGregor, Tex., assignors to Hercules Incorporated, Wilmington, Del.

Filed Feb. 12, 1981, Ser. No. 233,724
Int. Cl.³ F02K 9/72, 9/80
U.S. Cl. 60—251 **7 Claims**



1. A nozzle/valve for controlling the flow of combustion products from a fuel generator to a secondary combustion chamber of a ducted rocket motor, said nozzle/valve comprising:

a valve body having

a flow section comprising an outer flow member and a flow insulator for said outer flow member, housed within and extending throughout the length of the outer flow member, said flow insulator having side walls and a central longitudinal cavity defining a flow channel through said flow section, and a second cavity extending through the side wall of said flow insulator and said outer flow member,

a blockage body housing section directly external to said second cavity and in direct communication with said flow section, said blockage body housing section comprising an outer housing member defining a housing enclosure, and a housing insulator within said housing enclosure and contiguous to the inner surface of said housing member of all of said inner surface, the interior periphery of said housing insulator defining an internal cavity communicating with the second cavity of the flow section,

a blockage body element endwise mounted within the internal cavity defined by said housing insulator, a section of said blockage body element being rotatable into and out of the flow channel of said flow section as desired to control the flow of combustion products from said fuel generator,

means for imparting movement to said blockage body element, comprising a spool-shaped actuator means eccentrically rotatably mounted with its long axis perpendicular to but displaced from the centerline of said flow channel and endwise secured to said blockage body element, said actuator means being linked at a point intermediate its axial ends to a separately mounted actuator device through linking means; and

sensor controller means for activating said actuator device;

whereby rotation is imparted to said actuator means and endwise secured blockage element, to move said blockage body element between a closed position in which said blockage body element partially blocks the flow channel, and an open position in which said blockage body element is removed from the flow channel.

4,442,670

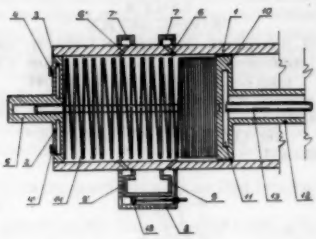
CLOSED-CYCLE HEAT-ENGINE

Jacob Goldman, 11/6 Biram St., Haifa, Israel

Filed Jul. 12, 1982, Ser. No. 397,410

Int. Cl.³ F02G 1/04

U.S. Cl. 60—517 18 Claims



1. A closed-cycle heat engine comprising a gas-filled cylinder and a piston reciprocating therein, wherein the cylinder walls are heat-insulated and the cylinder head is permenently heated by a fluid in contact with a heat source, and wherein the piston is permanently cooled by a fluid in contact with a heat sink, the heat engine being characterized by that the cylinder space between the cylinder head and the piston contains an expansible and contractible chain of a plurality of interconnected, parallel-positioned flat discs of a thin sheet material of a diameter slightly smaller than the cylinder diameter, whereof the outermost disc at each end is firmly and heat-conductively connected to the piston and to the cylinder head respectively, the discs of the two end portions of the chain being of a highly heat conducting material with flat and smooth surfaces serving as "cooler" and "heater" portions respectively, while the discs in the central portion are of low heat conductivity serving as "regenerator" portion, means being provided for gradually shifting the discs of the chain from a first position of closely packed discs of the cooler and regenerator portions adjacent the piston to a second position of closely packed discs of the heater and regenerator portions adjacent the cylinder head, this shifting being carried out at the end of the expansion stroke, and similar means being provided for returning the discs from the second position into the first position at the end of the compression stroke.

4,442,671

CONTROL VALVE ASSEMBLIES FOR TWO PEDAL-OPERATED HYDRAULIC BRAKING SYSTEMS

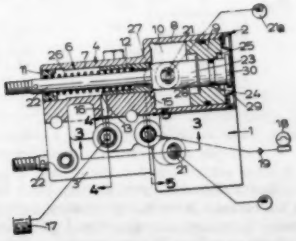
Desmond H. J. Reynolds, West Midlands, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed May 20, 1982, Ser. No. 380,466

Claims priority, application United Kingdom, Jun. 9, 1981, 8117555

Int. Cl.³ B60T 13/00

U.S. Cl. 60—547.1 8 Claims



1. A control valve assembly for vehicles comprising a pair of control valves each adapted to be operated by a separate respective pedal to apply a brake on a corresponding side of a vehicle, and pressure spaces in said control valves which are connected to the brakes are both interconnected by a transfer connection which is open when said pedals are operated simultaneously, in order to permit fluid to be transferred between said pressure spaces to compensate for differential wear of linings of said brakes, said transfer connection being closed to prevent such transfer when one pedal is operated on its own, each of said control valves incorporating a housing provided with a bore of stepped outline having a first bore portion of smaller area and a second bore portion of greater area, a spool working in said first bore portion, a back up piston separate from said spool and working in said second bore portion, a pressure space defined in said bore between said back-up piston and a closure for the opposite end of said bore, an outlet port in said housing to provide permanent open connection between said pressure space and said brake, a recuperation port in said housing for connection to a reservoir for fluid, a transfer port in said housing in permanent connection with said transfer connection, an inlet port in the housing connected to a source of high pressure fluid, and an imperforate rod for operating said spool and which is operated by said pedal, said rod being movable relative to said back-up piston through a limited distance determined by a degree of lost-motion and being sealingly slidable in a bore in said back-up piston, said spool normally being disposed in a retracted position in which said transfer port is closed and said recuperation port is in open communication with said pressure space, in turn placing said outlet port in communication with the reservoir, and operation of said pedal acting to move said rod relative to said back up piston in a brake-applying direction to urge said spool into a operative position to close said recuperation port, open said transfer port, and cause said pressure space to be pressurised from the source, subsequent movement of said rod upon failure of the source being adapted to take up the lost-motion and carry said back-up piston with it to pressurise the fluid trapped in said pressure space by said closed recuperation port.

4,442,672

BOOST CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINES WITH EXHAUST GAS TURBOCHARGER

Adolf Fischer, Haar, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

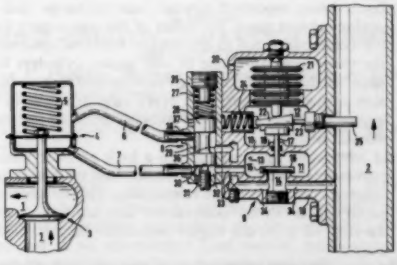
PCT No. PCT/EP81/00071, 371 Date Feb. 16, 1982, 102(e) Date Feb. 16, 1982, PCT Pub. No. WO81/03681, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 11, 1981, Ser. No. 355,591

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022345

Int. Cl.³ F02B 37/12

U.S. Cl. 60—602 4 Claims



1. A boost control device for an internal combustion engine with an exhaust gas turbocharger, comprising bypass valve means for controlling charge air flow in a bypass line disposed

parallel to an exhaust gas turbine of the exhaust gas turbocharger, operator means for operating the bypass valve means adapted to be selectively loaded in the opening and closing directions by charge air, control valve means for feeding charge air to the motor operator as a function of boost pressure, said control valve means selectively feeding charge air to the operator means of the bypass valve means in the closing direction up to a pre-established boost pressure and venting the charge air to the environment, pressure control valve means for loading by charge air in the opening direction, barometric plug means which is exposed to ambient pressure for loading the pressure control valve means in the closing direction, means for prestressing said barometric plug means in response to at least one of the ambient temperature and the charge air temperature.

4,442,673

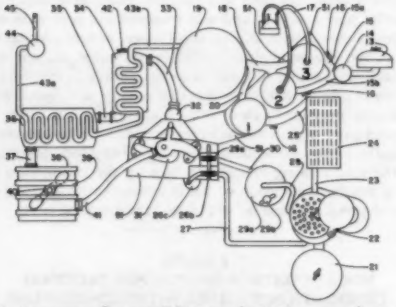
COMBINATION CYCLE, DUAL PROCESS ENGINE

Floy Haworth, Monett, Mo., assignor to Juanita J. Haworth, Monett, Mo.

Continuation of Ser. No. 210,037, Nov. 24, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,439

Int. Cl.³ F01K *23/14*

U.S. Cl. 60—618 **2 Claims**



1. Apparatus for providing mechanical power from normally wasted engine heat comprising:

at least one set of three adjacent in-line cylinders, two of said cylinders being engine cylinders and one of said cylinders being a compressor cylinder,

a carburetor for supplying fuel to the engine cylinders, and means for igniting said fuel, said engine cylinders operating on a four-stroke cycle,

means for supplying air to the compressor cylinder,

said engine cylinders including a liquid cooling system, a lubricating system and an exhaust manifold,

a steam generator connected to said exhaust manifold,

means for supplying a liquid to said steam generator, said liquid being vaporized through heat exchange with the engine exhaust gases, the outlet of the compressor cylinder being connected to the exhaust manifold upstream of the steam generator, one of said engine cylinders firing each 360 degrees of crankshaft rotation and each compression stroke coinciding with every exhaust stroke of said engine cylinders in order to combust inburned fuel in the exhaust manifold,

said lubricating system including a high pressure pump, a scavenging pump and an oil cooler, said oil cooler being located in heat exchange relationship with the means for supplying air to the compressor, said scavenging pump moving oil from the engine crankcase through said oil cooler,

the means for supplying air to the compressor including an engine vavle cover having surface fins thereon,

said engine liquid cooling system including a pump and two heat exchangers in series and in heat exchange relationship with the means for supplying liquid to said steam generator, a radiator and a coolant temperature controlled electric fan for regulating the temperature of the engine coolant,

and a steam engine connected to said steam generator.

4,442,674

DRIVING DEVICE

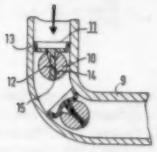
Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

Filed Sep. 10, 1981, Ser. No. 301,044

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034258

Int. Cl.³ F02N *13/00*; F16J *15/00*

U.S. Cl. 60—632 **6 Claims**



1. Driving device, including a pyrotechnical driving device for a backtightening device of a safety belt system comprising a cylinder having a curved cylinder section in which its cross-section deviates from a circular cross-section and its width is smaller than its length as measured by the cross-section's two axes, a non-resilient spherical piston in the cylinder unencumbered by a connecting rod and drive mechanism necessary to drive the piston but which piston can be driven by a fluid propellant, said spherical piston having a diameter smaller than the smallest inside width of the cylinder and a resilient sealing element which is cup-shaped with its cup rim in contact with the interior wall of the cylinder disposed on the driving side of the spherical piston which resilient sealing element during movement of the piston through the cylinder adapts itself to the changing cross-sectional shape of the curved cylinder and retains a constant position relative to the cylinder axis when passing through the cylinder curvature and, wherein the sealing element has a connecting pin which is axial to the cylinder axis and which connecting pin is fastened in an axial hole of the spherical piston.

4,442,675

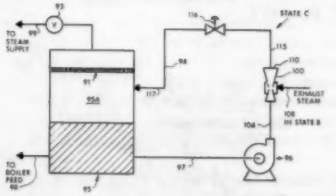
METHOD FOR THERMODYNAMIC CYCLE

Joseph Wilensky, Houston, Tex., assignor to Soma Kurtis and Jack Sloan, both of Denver, Colo.

Filed May 11, 1981, Ser. No. 262,783

Int. Cl.³ F01K *19/10*

U.S. Cl. 60—654 **8 Claims**



1. In a thermodynamic cycle having, (1) a transition of a working fluid from a State A (representing a pressure P_1 and a temperature T_1 outside a vapor/liquid phase region for the working fluid) to a State B' (representing a pressure P_2 lower than P_1 and a temperature T_2 lower than T_1) and (2) a transi-

tion from a State C' (representing a pressure P_3 which approximates P_1 and a temperature T_3 which is intermediate to temperature T_1 and temperature T_2) to State A, wherein the improvement comprises effecting a transition of the working fluid from State B' to State C' isenthalpically by:

absorbing into the working fluid in State B', energy provided by an incompressible motive fluid in an energized state and higher temperature than the working fluid by placing the two fluids in energy communication by educting the working fluid into the motive fluid of a jet eductor and thereby forcing the fluids, in attaining thermal equilibrium, to share their respective energies;

providing by recycle accumulation of liquid and/or drawing upon external sources of the motive fluid the amount of motive fluid for the energy communication, as determined by:

(1) fixing the quantity of working fluid introduced in State B',

(2) prescribing the State C' for the working fluid, and

(3) fixing the energized state of the motive fluid, to pressure the working fluid from State B' (representing a pressure P_2 lower than P_1 and a temperature T_2 lower thant T_1 and also lower than the critical temperature of the combined motive fluid and working fluid in the proportions in which the fluids are employed) to State C' adiabatically;

energizing the motive fluid by pumping;

separating the motive fluid from the working fluid between State C' and State A by:

(1) maintaining a constant motive fluid source inventory (at a temperature achieved in effecting the transition from State C' to State A) within a vessel that receives the liquid thus formed in total, and

(2) withdrawing any surplus liquid which will be perforce, working fluid.

4,442,676

PROCESS FOR IMPROVING THE THERMAL STABILITY OF FLUORO-CHLORO-HYDROCARBON

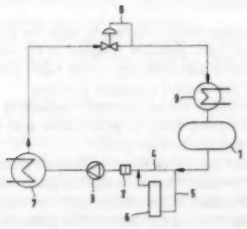
Werner Rudolph, and Guenter Fernschild, both of Hanover, Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Apr. 28, 1981, Ser. No. 258,054

Claims priority, application Fed. Rep. of Germany, May 8, 1980, 3017531

Int. Cl.³ F01K *25/08*

U.S. Cl. 60—671 **17 Claims**



1. A process for improving the thermal stability of fluoro-chloro-hydrocarbons and for preventing corrosion damage in a system wherein a fluoro-chloro-hydrocarbon is exposed to elevated temperatures, comprising the steps of:

circulating a fluoro-chloro-hydrocarbon around a system wherein the fluoro-chloro-hydrocarbon is exposed to a temperature between about 80° C. and 300° C. which is sufficiently high to cause decomposition of the fluoro-chloro-hydrocarbon; and

selectively passing the fluoro-chloro-hydrocarbon over an adsorption filter containing an adsorption medium consisting essentially of a basic high activity Al_2O_3.

4,442,677

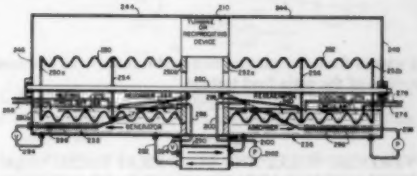
VARIABLE EFFECT ABSORPTION MACHINE AND PROCESS

Kenneth W. Kauffman, Philadelphia, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

Filed Nov. 17, 1980, Ser. No. 207,791

Int. Cl.³ F01K *25/06*

U.S. Cl. 60—673 **24 Claims**



1. A thermal machine in which there are three pressure stages, at high, intermediate and low pressures relative to one another, said pressure stages having means, including sealed chambers permitting maintenance of the respective pressures but permitting flow of vapors from one vessel to another within a stage, the high and low pressure stages containing at least one of two types of vessels, generation and absorption vessels, said pressure stages having means, including sealed chambers permitting maintenance of the respective pressures, one type vessel at the high pressure stage and the other type at the low pressure stage, and resorption and regeneration vessels at the intermediate pressure stage, fluid flow connection means providing at least one closed loop at least between the generation vessel, one of the regeneration and resorption vessels, and the absorption vessel, the vessels and fluid flow connection means being provided to contain and convey from one vessel to another an absorbent solution in liquid phase, said solution being selected to have a vapor component with which it may interact, and means permitting selected heat exchange between stages and with external circulants which, together with flow of vapors between various vessels within a pressure stage will effect a variable effect of heat inputs and outputs over a wide range of operating temperatures.

4,442,678

VAPOR GENERATING AND VAPOR SUPERHEATING INSTALLATIONS

Alan F. Hodgkin, Bovingdon, England, assignor to Babcock Power Limited, London, England

Filed Nov. 25, 1981, Ser. No. 324,979

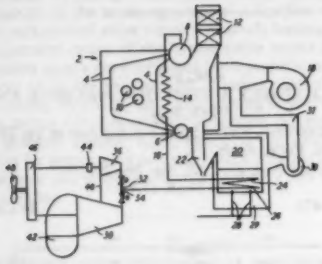
Claims priority, application United Kingdom, Nov. 26, 1980, 8037926

Int. Cl.³ F01K *15/00*

U.S. Cl. 60—676 **4 Claims**

4. A method of operating a marine propulsion unit including selectively supplying superheated vapour to a main load turbine and to an intermediate load turbine, producing superheated vapour for supply to the main load turbine in a fluent fuel fired vapour generating and vapour superheating unit, producing superheated vapour for supply to the intermediate load turbine by superheating in a fluent fuel fired fluidised bed

furnace vapour generated and partially superheated in the vapour generating and vapour superheating unit and discharging vapour from the intermediate load turbine to an intermediate stage of the main load turbine.



4,442,679

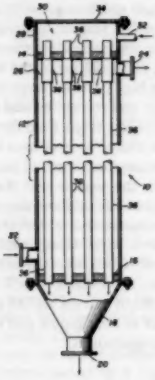
VERTICAL SHELL AND TUBE HEAT EXCHANGER WITH SLEEVES AROUND UPPER PART OF TUBES

Donald C. Stafford, Hinsdale; Tushar K. Shah, Cresthill, and Vincent F. Allo, Warrenville, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Mar. 28, 1983, Ser. No. 479,666

Int. Cl.³ B01D 9/04

U.S. Cl. 62—123 **3 Claims**



1. A freeze exchanger comprising:

a shell connected to vertically spaced apart horizontally arranged circular upper and lower tube sheets;

a plurality of vertically positioned parallel tubes, with each tube extending through and connected to a hole in each tube sheet;

means to feed a liquefied refrigerant gas to the lower part of the shell side of the heat exchanger and means to withdraw refrigerant vapor from the upper part of the shell side of the heat exchanger;

a liquid distribution box positioned above the upper tube sheet and means to deliver an aqueous feed liquid to the liquid distribution box;

a solid walled sleeve, surrounding and spaced outwardly from each tube, joined to the upper tube sheet and extending downwardly a short distance to terminate beneath the intended liquefied refrigerant level on the shell side, thereby providing a refrigerant vapor space between each sleeve and tube; and

a hole in and through the upper part of the sleeve wall near the upper tube sheet.

4,442,680

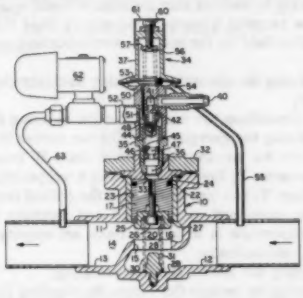
PILOT-OPERATED PRESSURE REGULATOR VALVE

William J. Barbier, and J. George Leimbach, both of St. Louis, Mo., assignors to Sporlan Valve Company, St. Louis, Mo.

Continuation of Ser. No. 202,462, Oct. 31, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,127

Int. Cl.³ F25B 41/04

U.S. Cl. 62—217 **4 Claims**



1. A pilot-operated pressure regulator valve in a refrigeration system having a compressor, a condensor, an expansion valve and an evaporator connected in series, comprising:

(a) a body having an inlet and an outlet interconnected by a passage for flow therethrough, the body inlet being connected to the outlet of the evaporator and the body outlet being connected to the inlet of the compressor,

(b) a main valve seat defining a main valve port in the passage,

(c) the valve body being provided with a chamber at one side of the main valve port,

(d) a main valve means movably mounted in the chamber for movement toward or away from the main valve seat to control flow through the main valve port, and subject to the pressure at the body inlet through the main valve port, the main valve means dividing the chamber into a first portion communicating with the main valve port on one side of the main valve means and a second portion on the opposite side of the main valve means from the main valve port,

(e) a first spring means tending to urge the main valve means toward an open position relative to the main valve port,

(f) a pilot valve seat defining a pilot valve port communicating with the second chamber portion,

(g) a pilot valve means movably mounted for movement toward or away from th pilot valve seat to control flow through the pilot valve port,

(h) a flexible motor element operatively connected to the pilot valve means for moving the pilot valve means,

(i) a second spring means subjecting one side of the flexible motor element to a predetermined pressure and tending to move the pilot valve means to an open position relative to the pilot valve port,

(j) means subjecting the other side of the flexible motor element to a pressure of the refrigerant upstream of the main valve port, and tending to move the pilot valve means to a closed position relative to the pilot valve port,

(k) means connecting the high pressure outlet of the compressor to the second chamber portion on the said opposite side of the main valve means through the pilot valve port for actuating the main valve means to control flow through the main valve port,

(l) bleed means communicating with the second chamber

portion for bleeding the high pressure from the second chamber portion for regulating the main valve means,

(m) means selectively closing the bleed means for retaining the high pressure in the second chamber portion for closing of the main valve port by the main valve means,

(n) second bleed means bypassing the pilot valve means and interconnecting the high pressure outlet of the compressor and the second chamber portion, the second bleed means providing high pressure to the second chamber portion when the pilot valve means is closed.

4,442,681

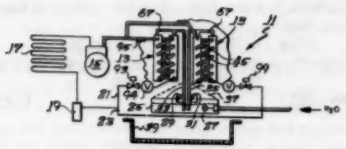
ICE-MAKER

Harry C. Fischer, P.O. Box 1687, Cocoa, Fla. 32922

Filed Sep. 28, 1981, Ser. No. 306,219

Int. Cl.³ F25C 1/12

U.S. Cl. 62—347 **4 Claims**



3. An ice-making machine which includes an evaporator for making pieces of water ice and means for supplying water thereto, which evaporator comprises

metal tubing formed to provide a plurality of parallel segments which are interconnected at alternate ends to form a coil,

said tubing segments being oval in cross section with a long major axis and a short minor axis,

support means made of synthetic resin material having a thermal conductivity not greater than about that of water ice,

said support means being molded to said tubing segments to form an evaporator assembly and having web sections extending between adjacent tubing segments and transversely extending vertical rib sections,

said long major axis of said oval cross section tubing segments being aligned with the plane of said web section, and

the thickness of said web section being smaller than the thickness of said tubing segment minor axis, and

a refrigeration system including a compressor and a condensor for causing relatively low-pressure cold refrigerant to flow through said tubing segments during ice-making and including means for causing relatively high-pressure warm refrigerant to flow through said tubing segments during harvesting,

whereby when water is supplied to opposite surfaces of said coil-support means assembly and refrigerant passes through said tubing segments, ice pieces are formed upon the exposed surfaces of said tubing segments between adjacent rib sections growing outward in opposite directions and whereby application of higher pressure within said tubing segments causes outward bulging which change in outer contour causes said ice pieces to break loose from the surface of said evaporator during harvesting.

4,442,682

TURBINE FOR USE IN REFRIGERATION CYCLE

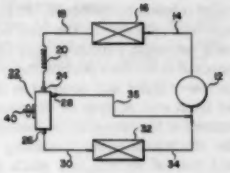
Hirotsugu Sakata, Chigasaki; Shigemi Nagatomo, Tokyo, and Takashi Matsuzaka, Fuji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 421,773

Claims priority, application Japan, Sep. 30, 1981, 56-155184

Int. Cl.³ F25D 9/00

U.S. Cl. 62—401 **7 Claims**



1. A turbine for use in refrigeration cycle comprising:

a casing having an inner circumferential wall to define a closed space;

a turbine runner housed freely rotatable in the space of said casing;

an injection nozzle through which refrigerating medium having at least one of pressure-based energy and kinetic energy is introduced into the casing to blow upon and rotate the turbine runner;

a liquid refrigerating medium receiving section arranged at the lower end of said casing to collect liquid refrigerating medium;

a first liquid refrigerating medium discharging outlet through which the liquid refrigerating medium collected in said receiving section is fed to an evaporator arranged in the refrigeration cycle; and

a second refrigerating medium discharging outlet communicated with the space in said casing above the liquid refrigerating medium receiving section and feeding gaseous refrigerating medium present in said space above the receiving section to the refrigeration cycle at a point downstream from said evaporator.

4,442,683

STITCH PRESSING DEVICE FOR FLAT KNITTING MACHINE

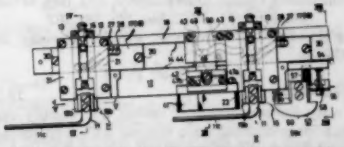
Masahiro Shima, and Hirotsugu Nishida, both of Wakayama, Japan, assignors to Shima Idea Center Co., Ltd., Wakayama, Japan

Filed Apr. 12, 1982, Ser. No. 367,407

Claims priority, application Japan, Apr. 28, 1981, 56-64490

Int. Cl.³ D04B 7/04

U.S. Cl. 66—64 **11 Claims**



1. A stitch pressing device for flat knitting machine, comprising stitch pressing means arranged on a carriage and operable at substantially same phases as the operative zones of knitting and transfer locks on the carriage, and sub-presser means disposed on the carriage and operable at different phases from the operative zones of the knitting and transfer locks on the carriage, said stitch pressing means comprising a pair of one-way operable stitch pressing means, one provided on one cam box of the carriage and having a stitch presser bar adapted to

enter a gap between a pair of needle beds for slide contact with formed stitches during the movement of the carriage in one direction and the other provided on another cam box of the carriage and having a stitch presser bar adapted to enter said gap between the needle beds for slide contact with formed stitches during the movement of the carriage in the opposite direction, said one-way operable stitch presser means each comprising a support means mounted on the front top surface of one of the cam boxes, a pair of sliders, upper and lower, individually slidably supported on said support means in substantially parallel relation to the needle tricks of the needle bed below the cam box opposite to the cam box on which said support means is mounted, a stitch-presser-bar mounting block pivotally connected at the base portion thereof to the front end portion of the lower slider and coupled at the upper free end thereof to the front end portion of the upper slider, a stitch presser bar secured at the base portion thereof to the upper end portion of the stitch-presser-bar mounting block, and drive means for said pair of sliders, said stitch presser bar being L-shaped and comprising a portion corresponding to the upper part of the vertical portion of "L" and at which it is secured to said mounting block, a portion corresponding to the lower part of said vertical portion and downwardly inclined toward the mounting block, and a portion corresponding to the horizontal portion of "L" and constituting an operative portion extending longitudinally of said gap between the needle beds, said drive means for the pair of sliders comprising pins individually projecting from the sliders, a pair of cam grooves individually engaging said pins, and a grooved cam plate carried by said support means slidably along the length of the needle beds, said pair of cam grooves having a cam surface for moving said upper and lower sliders to impart movement involving a circular motion above the knockover comb to the front portion of said stitch presser bar for entry into and retraction from the gap between the needle beds, said sub-presser means comprising a mounting member having its lower end portion pivotally supported at a suitable location on said support means on the cam box and having its upper end portion adapted to move toward and away from the knockover comb, spring means urging the upper end portion of the mounting member in the forward direction, a stopper for stopping the urging force of the spring at a given forward position, and a sub-presser element secured at the base portion thereof to the upper end portion of the mounting member, said sub-presser element having its front end portion downwardly inclined at a point past the space right above the knockover comb and positioned in the gap between the needle beds, said front end portion having on its both sides a sled-shaped arcuate surface extending longitudinally of the needle beds and being constantly urged deeper into the gap than said stitch presser bar.

4,442,684

CONTROL OF WEFT THREAD INSERTION

Gerhard Bergmann, Heusenstamm, and Gerhard Hittel, Rodgau, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 398,202

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1981, 3128024

Int. Cl.³ D04B *23/06*

U.S. Cl. 66—84 A **19 Claims**

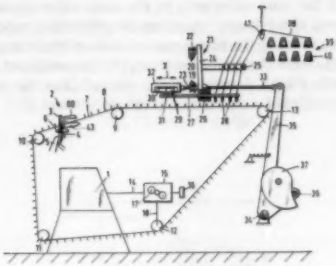
1. A warp knitting machine having a cyclically operable needle bed for producing ware inlayed with weft threads and having a weft thread insertion means comprising:

a pair of spaced forwarding means carrying said weft threads toward said needle bed;

a weft thread deflector mounted adjacent to and up stream of said needle bed for deflecting the forwardmost one of said weft threads to prevent its reaching said needle bed;

a plurality of holders separately mounted equidistantly on each of said pair of forwarding means for holding transversely positioned, spaced sequences of said weft threads;

drive means coupled to said pair of forwarding means and control means for said forwarding means to provide a



weft thread arrival rate at the needle bed of less than one weft thread per cycle of said knitting machine.

4,442,685

SLIDE FASTENER STRINGER FOR KNIT FABRICS

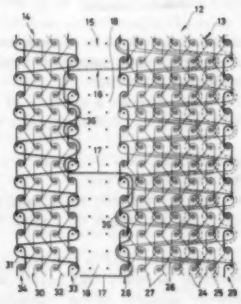
Nyuzen Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jan. 7, 1981, Ser. No. 223,201

Claims priority, application Japan, Jun. 25, 1980, 55-89252[U]

Int. Cl.³ D04B *23/08*

U.S. Cl. 66—193 **12 Claims**



1. A slide fastener stringer for knit fabrics, comprising:

(a) a warp-knit stringer tape including a pair of longitudinal warp-knit webs spaced transversely from each other with a longitudinal wale-free region therebetween defined by confronting wales, each said web comprised of warp and weft threads, one of said warp-knit webs being narrower than the other wider warp-knit web, and a thread independent of said weft threads interconnecting said webs and having a pair of series of first and second longitudinal portions extending respectively in said wider and narrower warp-knit webs at longitudinal intervals, said first longitudinal portions lying only in one of said confronting wales, and substantially parallel adjacent portions all extending transversely across said wale-free region and spaced longitudinally at an equal interval, thereby defining a plurality of substantially rectangular openings longitudinally in and along said wale-free region; and

(b) A row of coupling elements mounted on said wider warp-knit web remotely from said wale-free region; whereby loops of the knit fabric may be connected to said parallel portions of said thread.

4,442,686

SUPPORT TUBES FOR CROSS-WOUND COILS AND CROSS-WINDINGS

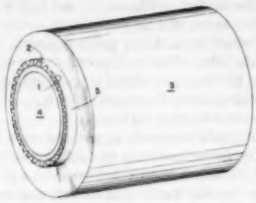
Hans Beffart, Mörlenbach-Voech, and Hans M. Ries, Jockgrim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,060

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124135

Int. Cl.³ D06B *23/04;* B65H *75/18*

U.S. Cl. 68—198 14 Claims



1. A cylindrical or conical support tube for taking up shrinkable yarns which are thereafter subjected to bleaching or dyeing while on said support tube, comprising a cylindrical or conical lower layer of a porous elastic non-woven fabric of synthetic fibers and/or endless fibers which are cemented together, said lower layer being corrugated in the direction parallel to the longitudinal direction of said tube, and an upper layer of a porous elastic non-woven fabric of synthetic fibers and/or endless fibers which are cemented together to form a continuous cylindrical or conical surface, said upper layer covering said lower layer and being connected thereto at the areas of the largest diameter of the folds in said corrugated lower layer.

4,442,687

APPARATUS FOR THE TENTERING OF SKINS OR HIDES IN THE MANUFACTURE OF LEATHER

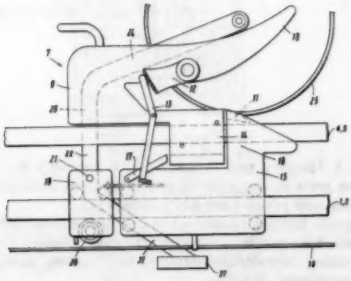
Wolfgang Müntjes, Mulheim an der Ruhr, Fed. Rep. of Germany, assignor to Ludw. Lindgens KG Lederfabrik, Müiheim an der Ruhr, Fed. Rep. of Germany

Filed Sep. 3, 1980, Ser. No. 183,693

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1979, 2936118

Int. Cl.³ C14B *1/58*

U.S. Cl. 69—1 23 Claims



1. In a device for tentering skins or hides for the manufacture of leather, having a tentering frame arranged on a machine table, in which frame a plurality of tentering clamps are held displaceably on substantially radial guides, the improvement comprising

pressing means operatively coordinated adjacent to each said tentering clamp and such that said pressing means is displaceably mounted with said tentering clamp,

said pressing means for holding a skin to be tensioned fast in position in which it has been placed on the tentering frame.

4,442,688

VEHICLE STEERING LOCK ARRANGEMENT

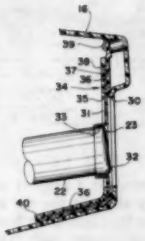
Nobuo Saegusa, Zama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed May 13, 1982, Ser. No. 377,808

Claims priority, application Japan, Jun. 11, 1981, 56-89994

Int. Cl.³ B62D *1/18;* E05B *65/12*

U.S. Cl. 70—252 10 Claims



1. A steering lock arrangement for a vehicle with a steering wheel permitted to tilt within a predetermined range, comprising:

(a) a stationary instrument panel having an aperture;

(b) a key-receiving member associated with the steering wheel and moving within a predetermined range as the steering wheel tilts, the key-receiving member having a slot for receiving a steering lock operating key, the key-receiving member being located at the back of the instrument panel in such a manner that the slot faces the aperture;

(c) the aperture having such dimensions that the slot will remain inside the boundary of the aperture, as seen substantially from the normal position of the vehicle driver, throughout the range of movement of the key-receiving member; and

(d) a shielding member connected to the key-receiving member and engaging the instrument panel in such a manner as to cover the gap between the key-receiving member and the instrument panel to hide the back of the instrument panel, the shielding member being mounted for movement to permit movement of the key-receiving member, the shielding member continually covering the gap during movement of the key receiving member.

4,442,689

LUBRICATING DIE HOLDER

Arnold Senatore, 605 Benningron Dr., Union, N.J. 07083

Filed Feb. 16, 1982, Ser. No. 348,950

Int. Cl.³ B21C *9/00*

U.S. Cl. 72—41 8 Claims

1. Lubricating die holder comprising

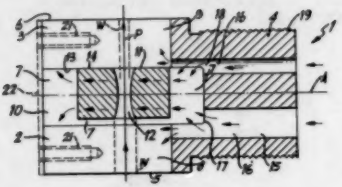
a body adapted to be mounted on a support,

the body having a front entrance side and a rear exit side, and containing a die holder chamber provided with an entrance opening extending therefrom to the entrance side and an exit opening extending therefrom to the exit side and defining a die drawing path extending through the body from the entrance opening into the chamber and in turn from the chamber to the exit opening,

the chamber being adapted to receive operatively movably therewithin a separate drawing die of the type capable of reducing the size of a wire or the like type article passing

along the drawing path from the entrance side to the exit side of the body, and

lubricating coolant flow conduit means extending into the body and terminating in feed aperture means flow communicating directly with the chamber and directly with the entrance and exit openings and arranged for feeding lubricating coolant in a direction crosswise of the drawing path and into direct contact with the die and article in the chamber and in the entrance and exit openings, wherein the body is provided with a substantially cylindrical elongated shape having a longitudinal axis extending in crosswise orientation to the drawing path for permitting the die



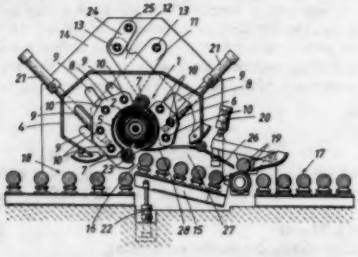
holder to be mounted on a support via a coacting clamp means, for readily aligning the die holder precisely between an upstream feed means for feeding the wire or the like article along the drawing path to the separate drawing die through the entrance opening and a downstream recovery means for recovering the reduced size wire or the like article along the drawing path from the separate drawing die through the exit opening, both in terms of the axial position of the body along such longitudinal axis relative to the drawing path and the rotational angular position of the body and of the entrance opening and exit opening about such longitudinal axis relative to the drawing path.

4,442,690

COILER-FURNACE COMBINATION

Franz Hirschmanner, Leonding, and Ernst Rom, St. Veit a.d. Glan, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jul. 23, 1982, Ser. No. 401,370
Claims priority, application Austria, Aug. 24, 1981, 3669/81
Int. Cl.³ B21C *47/06, 47/18*
U.S. Cl. 72—128 **5 Claims**



1. In a coiler-furnace combination comprising

a heat-shielding hood,

a horizontal coiler mandrel disposed in said hood and rotatable in a predetermined sense to coil strip on said mandrel and in the opposite sense to uncoil said strip from said mandrel,

strip-guiding means for guiding said strip around said mandrel as it is coiled on and uncoiled from said mandrel, which strip-guiding means comprise pressure rollers for forcing said strip against said mandrel and two part-cylindrical guide segments which are disposed on opposite sides of and movable toward and away from said mandrel, one of said guide segments preceding the other in said predetermined direction, said other guide segment having a delivery edge for delivering said strip as it is coiled up on said mandrel,

actuating means for urging each of said guide segments toward said mandrel generally in a predetermined direction,

means for heating strip coiled on said mandrel,

a strip transfer bridge, which is pivoted below said mandrel and adapted to transfer said strip from and to said mandrel and is adjoined by said one guide segment, and

a pivoted strip lifter which is disposed above said bridge and adapted to lift the outer end of strip coiled on said mandrel from the remainder of said coiled strip,

the improvement residing in that

each of said guide segments is secured to a pivoted arm, which extends transversely to said predetermined direction and is mounted outside said hood on a pivot having an axis that is parallel to the axis of said mandrel,

said delivery edge constitutes said strip lifter, and

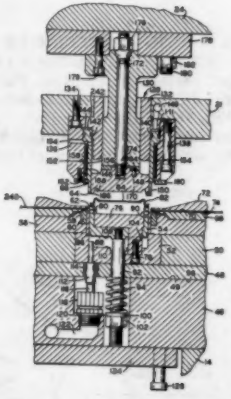
separate drive means are provided for imparting a pivotal movement to said bridge independently of said actuating means.

4,442,691

DOUBLE ACTION PRESS HAVING FLOATING PUNCH

Arthur L. Grow, Versailles; Charles J. Gregorovich, St. Marys, and Donald N. Seyfried, New Bremen, all of Ohio, assignors to The Minster Machine Company, Minster, Ohio

Continuation of Ser. No. 165,966, Jul. 7, 1980, abandoned. This application Feb. 22, 1983, Ser. No. 468,490
Int. Cl.³ B21D *28/02, 28/20*
U.S. Cl. 72—329 **17 Claims**



1. A blanking and forming punch assembly for a double action press having two slides reciprocated through separate strokes, said punch assembly comprising:

a guide housing connected to one of the press slides,

a blanking punch received in said guide housing for reciprocating movement relative to said housing along a given rectilinear direction,

a preloaded antifriction bearing positioned between said punch and housing and in continuous antifriction contact with said punch and housing during the entire stroke of said punch to accurately guide and align said punch relative to said housing,

means interposed between said punch and housing for yieldably urging said punch in a direction out of said housing

toward one of the limits of travel of said punch relative to said housing,

a forming die received in said guide housing for reciprocating movement relative to said housing along said rectilinear direction, said forming die being connected to the other press slide, and

a die assembly mounted to the press and coacting with said punch and forming die.

5. A double action press comprising:

a bed portion,

a blanking slide,

a forming slide

drive means connected to said slides for reciprocating said slides along respective rectilinear paths on one side of said bed portion, said drive means comprising a crankshaft having at least two eccentrics thereon and at least two connecting rods connected to respective said slides and respective said eccentrics, said drive means causing said blanking slide to lead said forming slide,

a forming die comprising a first forming tool element connected to said forming slide and a second forming tool element connected to the bed portion of the press, said tool elements adapted to coact with each other to form a part therebetween when brought together by said forming slide,

a blanking die comprising a blanking punch connected to said blanking slide and a blanking tool element connected to the bed portion of the press, said punch and blanking tool element adapted to coact with each other to cut out a blank when brought together by said blanking slide at about the dead center position of the eccentric driving said blanking slide,

said punch being reciprocally connected to said blanking slide for movement relative to said blanking slide in a direction parallel to the rectilinear movement of said blanking slide,

said drive means causing said blanking slide to positively and non-yieldably engage said punch at about said dead center position of the eccentric driving said blanking slide to cut out a blank, and

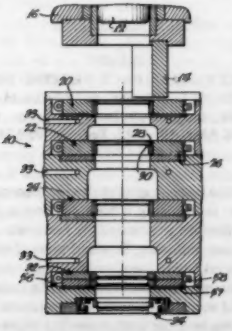
means for yieldably urging said punch in said rectilinear direction of said blanking slide away from said blanking slide to extend relative to said blanking slide and exert a holding force on the blank as said blanking slide moves away.

4,442,692

TANDEM IRONING LAND ASSEMBLY

Seung W. Lyu, Palos Hills, Ill., assignor to National Can Corporation, Chicago, Ill.

Filed Nov. 23, 1981, Ser. No. 323,747
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **9 Claims**



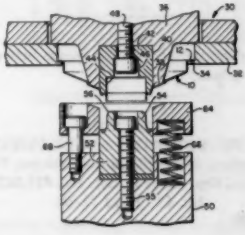
1. An ironing assembly for use with a punch to iron a sidewall of a thin-walled container having an integral end wall comprising a pair of spaced ironing lands with the first of said ironing lands having a diameter to produce a sidewall reduction of at least thirty-five percent and said second ironing land having a diameter in the range of about 1.00003 to about 1.0003 times greater than the diameter of said first ironing land to produce a sidewall reduction in the range of about 0.1 to about 1 percent.

4,442,693

METHOD OF AND APPARATUS FOR SHAPING NECK AND PROVIDING TERMINAL CURL ON CAN END

John Walter, Evergreen Park, Ill., and Charles S. Kubis, Weston, Conn., assignors to The Continental Group, Inc., Stamford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,644
Int. Cl.³ B21D *72/00*
U.S. Cl. 72—354 **15 Claims**



1. A method of forming a terminal neck portion and a terminal curl on a metal can end, said method comprising the steps of providing a partially formed can end having a tubular central portion, while supporting the partially formed can end backing up the can end surrounding the tubular central portion, effecting close relative telescoping between the tubular central portion and a die pin, and then forcing the terminal end of the tubular portion into a curling die surrounding the die pin to effect automatic radially outward curling of a terminal end part of said tubular portion.

4,442,694

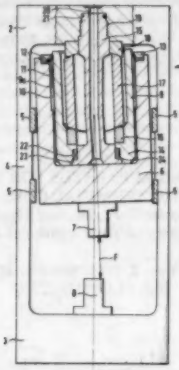
FLOOR-MOUNTED FORGING PRESS HAVING A STATIONARY PISTON WITH A BORE FOR SUPPLYING A PRESSURE MEDIUM, AND A MOVING CYLINDER

Hermann Füsser, Haan; Horst Groos, Metzkausen, and Heinz Schmoll, Kaarst, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,368
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046110; Dec. 13, 1980, 3047068
Int. Cl.³ B21J *9/18*
U.S. Cl. 72—453.01 **12 Claims**

1. A floor-mounted forging press comprising a press frame, a top beam on said frame, a vertical hollow piston, piston supporting means for supporting said piston on said top beam stationary relative thereto in the direction of the press stroke, a vertically movable cylinder slidably mounted on said piston, a tool being mountable on said cylinder, an upper downwardly facing ball cup mounted on the top beam, a lower upwardly facing ball cup mounted in a lower region of the interior of the hollow piston, a bearing member interposed between said ball cups for transmitting axial loads while allowing said piston to tilt relative to said top beam, and a conduit means connected to

the top beam and extending through the top beam and the interior of the piston for supplying a pressure medium to the



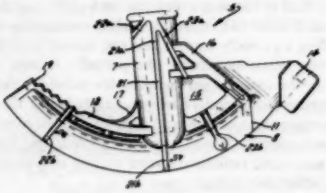
interior of the cylinder, and sealing means between said conduit and said top beam and piston.

4,442,695

CONDUIT BENDER WITH ANGLE INDICATIONS

William E. Gardner, 4448 Trillium La., Slinger, Wis. 53086

Filed Sep. 20, 1982, Ser. No. 419,802
Int. Cl.³ B21J *13/08*
U.S. Cl. 72—459 **9 Claims**



1. A tool for bending conduit and the like whereby conduit can be curved to establish a selected one of a plurality of predetermined bend angles therein, said tool comprising a body that has an elongated shoe portion with a bottom surface which is curved to a convex arc along its length and which is concavely curved from side to side symmetrically to a plane of symmetry, a substantially cylindrical handle supporting portion that projects upwardly from said shoe portion intermediate the ends thereof with its axis in said plane, and an upwardly opening hook portion projecting beyond one end of said shoe portion for engagement under conduit to apply bending force thereto in cooperation with said bottom surface and a supporting surface overlain by the conduit, said tool being characterized by:

A. said handle supporting portion having thereon a plurality of straight and narrow ridges that define first sighting line segments which
  (1) are contained in a sighting plane parallel to said plane of symmetry,
  (2) extend at acute angles to one another, and
  (3) diverge downwardly from a point near the top of said handle supporting portion;

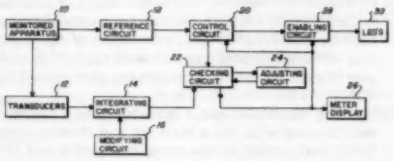
B. said shoe portion having thereon a like plurality of straight and narrow ridges
  (1) which are spaced apart along the length of the shoe portion, and
  (2) each of which defines a second sighting line segment that
    (a) is contained in said sighting plane, and
    (b) is in lengthwise alignment with one of said first sighting line segments and cooperates therewith when extending perpendicular to a supporting surface to identify one of said bend angles.

4,442,696

CALIBRATION FAULT DETECTOR AND AUTOMATIC CALIBRATOR

Lowell H. Erickson, 1495 S. Steele St., Denver, Colo. 80210, and Marcellus S. Merrill, 678 Lafayette, Denver, Colo. 80218

Filed Mar. 10, 1980, Ser. No. 129,269
Int. Cl.³ G01C *25/00*
U.S. Cl. 73—1 E **25 Claims**



1. A calibration fault detecting and automatic calibrating apparatus for observing the position of a monitored apparatus which varies in position, comprising:

first means for producing a first signal corresponding to the position of the monitored apparatus;

second means for generating a second signal indicating that the monitored apparatus is at a first preestablished reference position, said second means including reference means having target means, said target means being connected to the monitored apparatus and movable therewith, said reference means further having means communicating with said target means for producing an input to said target means, the input being used by said target means for providing an output to said means for producing, the output being used in generating the second signal; and

third means responsive to said first means and said second means, said third means including means for generating a predetermined output representing the first preestablished reference position of the monitored apparatus and also including means for determining whether the first signal corresponds to the predetermined output, this determination being made when the monitored apparatus is at the first preestablished reference position to determine whether the automatic calibrating apparatus is correctly calibrated.

4,442,697

PRE-STRESSED IMPACT TESTING DEVICE

Brian L. Jones; David L. Johnson, and Merlin H. Moseman, all of Omaha, Nebr., assignors to InterNorth, Inc., Omaha, Nebr.

Filed Mar. 19, 1982, Ser. No. 359,742
Int. Cl.³ G01N *3/30*
U.S. Cl. 73—12 **11 Claims**

1. A pre-stressed impact testing device, comprising,

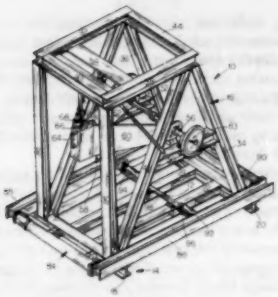
a frame means comprising a base portion and a pendulum supporting portion positioned thereabove,

said base portion including first and second elongated horizontally spaced frame members having opposite ends, and a third frame member secured to and extending between said first and second frame members to one end thereof,

a ram means secured to and extending between the other ends of said first and second frame members for selectively moving the said other ends of said first and second

frame members away from each other whereby said first and second frame members are elastically bent,

connector means on each of said first and second frame members intermediate the length thereof for attachment to the opposite ends of the sample material whereby said



sample material will be placed in stress when said first and second frame members are elastically bent,

a pendulum means mounted on said pendulum supporting portion for impacting and fracturing the sample material,

and means for measuring the amount of travel of said pendulum means after it fractures the sample material.

4,442,698

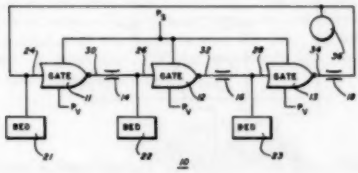
MOLECULAR SIEVE OXYGEN MONITOR

David N. Alftine, Bettendorf, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Filed Jan. 24, 1983, Ser. No. 460,307

Int. Cl.³ G01N *31/06*

U.S. Cl. 73—23 **3 Claims**



2. A monitoring system for determining the concentration of any particular gas in a system for producing a product gas enriched in that particular gas comprising:

a plurality of pneumatic nor gates coupled in a series to form a closed loop each nor gate in a first open condition, directing the flow of said product gas to an outlet port of said gate and, in a second closed condition, blocking the flow of said product gas and coupling the outlet port of said gate to a vent port of said gate,

means for coupling the outlet port of each gate to the control port of the subsequent gate to form said closed loop thereby causing the gates to sequentially open and close such that each subsequent gate assumes an open or closed condition opposite to the condition of the preceding gate,

the pneumatic pressure means at said outlet port for causing the subsequent gate to go to either an open or closed condition,

a corresponding plurality of molecular sieve beds each pneumatically connected to the control port of said nor gates to adsorb said particular gas from said product gas,

in said first open condition attenuate the rate of pressure rise in said control ports, and

in said second closed condition attenuate the rate of pressure decay in said control port, and

means for inferring the particular gas concentration of said product gas from the oscillation frequency of the monitor.

4,442,699

MONITORING THE DUST CONTENT OF GASEOUS FLUID

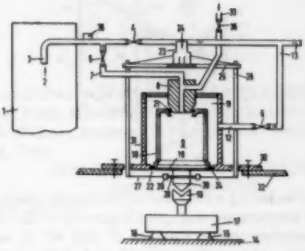
Daniel Ramelot, St-Nicolas, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Feb. 23, 1981, Ser. No. 236,973

Claims priority, application Belgium, Feb. 25, 1980, 881910; Apr. 3, 1980, 882639

Int. Cl.³ G01N *31/00*

U.S. Cl. 73—28 **9 Claims**



1. Apparatus for monitoring the dust content of a dust-laden gaseous fluid, comprising

(a) a dust filter having an input side and an output side;

(b) means for moving the filter between a sampling position and a weighing position;

(c) a chamber which surrounds the filter in a leak-tight manner when the filter is in the sampling position, the chamber having an inlet conduit on the input side of the filter and an outlet conduit on the output side of the filter;

(d) means for weighing the filter in the weighing position, the weight of the filter in the weighing position being wholly supported by the weighing means, the filter in the weighing position being no longer surrounded in a leak-tight manner by the chamber;

(e) means for continuously taking a sample of the dust-laden gaseous fluid;

(f) means for conveying the sample to the inlet conduit of the chamber to pass through the filter in the sampling position; and

(g) means for preventing the sample from passing through the filter in the weighing position.

4,442,700

ULTRASONIC HYDROMETER

Carl A. Swoboda, Naperville, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

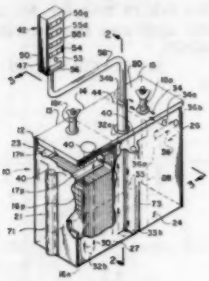
Filed Mar. 9, 1982, Ser. No. 356,567

Int. Cl.³ G01N *9/00*

U.S. Cl. 73—32 A **6 Claims**

1. A portable ultrasonic hydrometer for determining the specific gravity of the electrolyte in a wet battery such as lead-acid battery having a case with one sonic surface formed on the inside of the battery case under the level of the electrolyte and with an opposing sonic surface boundary of the electrolyte spaced a distance "d" therefrom, the combination comprising sensing means for determining the temperature of the electrolyte, transduer means, a probe for holding the temperature sensing and transducer means whereby they can be hand held flush against the outside of the battery case opposite the

one sonic surface, means for exciting the transducer means to emit an ultrasonic impulse against the outside of the case for transmssion through the case and from the one sonic surface into the electrolyte, whereby the impulse traverses the electrolyte, reflects off the spaced opposing sonic surface boundary and returns through the electrolyte to and is detected by the transducer means, timer means for measuring the lapsed time "t" between the initial impulse of the transducer means and the detected returning impulse, means for calculating with the equation "V=2d/t" the sonic velocity "V" through the elec-



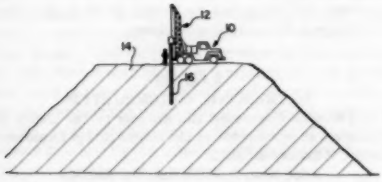
trolyte, means including a database corelating the sonic velocity in and the temperature and specific gravity of the electrolyte for temperature values between 0° and 40° C. and for specific gravity values between 1.05 and 1.30, means for searching the database for specifically known inputs including the calculated sonic velocity in and measured temperature of the electrolyte for determining the corresponding specific gravity of the electrolyte, housing means, and said exciting means, timer means, calculating means and searching means being disposed in the housing, and flexible conductor means between the housing means and the probe.

4,442,701

METHOD FOR MEASURING DENSITY OF A BULK MATERIAL IN A STOCKPILE

David C. Cowherd, Centerville; Jerry L. DeWitte, Spring Valley; Kenneth A. Taylor, Dayton; William C. Whitaker, Xenia; Daniel S. Wolfe, Springfield, and Gene A. Wolfe, Fairborn, all of Ohio, assignors to Bowser-Morner, Inc., Dayton, Ohio

Filed Feb. 25, 1983, Ser. No. 470,028
Int. Cl.³ G01N *9/24, 9/02*
U.S. Cl. 73—32 R **10 Claims**



1. A method of determing the density of cohesionless bulk material in a stockpile, comprising the steps of:

completely boring a test hole substantially to the bottom of said stockpile;

following complete boring of said hole, positioning one end of a first section of steel casing of an outer diameter substantially equal to the diameter of said test hole at or near the opening to said hole;

applying a first force to the opposite end of said first section until said section is pushed partially into said hole;

connecting a second section of casing to the upper end of said first section;

applying a force substantially equivalent to said first applied force to the upper end of said second section until said second section is pressed partially into said test hole, whereby said first section is driven further into said test hole;

connecting additional sections of casing and inserting said sections into said test hole until said casing sections extend the full depth of said test hole;

after said casing sections extend the full depth of said hole, inserting the probe of a nuclear depth-density gauge into said test hole and locating said probe at a predetermined depth along said hole, said probe having a length of cable attached thereto;

taking a series of timed readings with said gauge; and

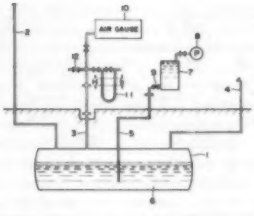
moving said probe along said test hole such that at the beginning of each of said readings following the first thereof, said probe is at a location along said test hole separated by a predetermined interval from its location at the beginning of the last preceding one of said readings, whereby each of said readings taken corresponds to one of a plurality of predetermined depths along said test hole.

4,442,702

METHOD OF AND APPARATUS FOR INSPECTING LIQUID STORAGE TANKS FOR LEAKS BY MEANS OF PRESSURE DECREASE AND INCREASE

Koji Sawada, Tokyo, Japan, assignor to Nippon Engineer Service Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00227, 371 Date Apr. 26, 1982, 102(e) Date Apr. 26, 1982, PCT Pub. No. WO82/00885, PCT Pub. Date Mar. 18, 1982
PCT Filed Sep. 9, 1981, Ser. No. 375,264
Claims priority, application Japan, Sep. 9, 1980, 55-123968
Int. Cl.³ G01M *3/32*
U.S. Cl. 73—49.2 **2 Claims**



1. A method of testing for leakage of a tank that contains a liquid having a high vapor pressure, said method being characterized by:

A. sealing the tank from the atmosphere;

B. with the tank thus sealed, withdrawing from the tank to a container a part of the liquid stored in the tank, to reduce pressure in the portion of the tank that is above the liquid therein to a subatmospheric value;

C. making a first measurement of the rate of increase per unit of time of pressure in said portion of the tank, during at least a final portion of a period long enough to ensure that said rate has attained a stable value;

D. while said part of the liquid remains in said container, venting the tank to atmosphere to equalize pressure in said portion of the tank with atmospheric pressure;

E. thereafter resealing the tank from the atmosphere;

F. with the tank resealed, returning to the tank from said container the part of the liquid that had been withdrawn from the tank, to increase the pressure in said portion of the tank to an above-atmospheric value; and

G. making a second measurement of the rate of increase per unit of time of pressure in said portion of the tank, through

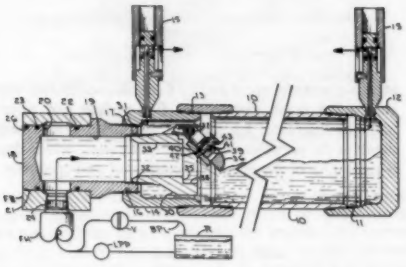
at least a final portion of a period long enough to ensure that said rate has attained a stable value, for comparison with the rate found by said first measurement, the existence of a leak in the tank being signified by a difference between the compared rates.

4,442,703

PIPE TESTING APPARATUS

Fred L. Herman, 11931 Kemp Hollow La., Houston, Tex. 77043, and Kenneth H. Johns, Box 316, County Rd. 80, Manvel, Tex. 77578

Filed Mar. 15, 1982, Ser. No. 358,243
Int. Cl.³ G01M *3/28*
U.S. Cl. 73—49.5 **9 Claims**



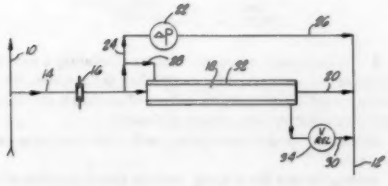
1. Apparatus for use in hydrostatically testing a length of pipe, comprising means for closing each end of the pipe, one such closing means having port means to which fill and pressure hoses from high volume, low pressure and low volume, high pressure pumps may be respectively interchangeably connected, and valve means within the one closing means for permitting water to flow into the pipe when the fill hose from the high volume, low pressure pump is connected to said port means, and, upon filling of the pipe with water and disconnection of the fill hose from the port means, holding the water in the pipe, and then, upon connection of the pressure hose from the low volume, high pressure pump to said port means and pressurizing of the water within the pipe, permitting such water to drain from the pipe when said low volume, high pressure pump is stopped.

4,442,704

VISCOSITY METER

Judson S. Swearingen, 27403 Pacific Coast Hwy., Malibu, Calif. 90265

Filed Jul. 12, 1982, Ser. No. 397,096
Int. Cl.³ G01N *11/08*
U.S. Cl. 73—55 **7 Claims**



1. A viscosity meter comprising

a fluid conduit including a main inlet, an orifice downstream of said main inlet, a main capillary downstream of said orifice, a main outlet downstream of said main capillary;

a shunt conduit across said main capillary including a shunt inlet from said fluid conduit downstream of said orifice, a shunt outlet to said main outlet, a shunt capillary between said shunt inlet and said shunt outlet, and means for controlling flow through said shunt conduit responsive to pressure across said main capillary; and

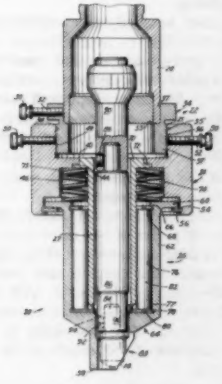
a differential pressure meter across said main capillary.

4,442,705

CLAMPING NOSEPIECE FOR HARDNESS TESTER

Elliot R. Lang, Hamden, and Edward L. Tobolski, Bencon Falls, both of Conn., assignors to Page-Wilson Corporation, Bridgeport, Conn.

Filed Jun. 14, 1982, Ser. No. 388,213
Int. Cl.³ G01N *3/44*
U.S. Cl. 73—83 **10 Claims**



1. A clamping nosepiece for a hardness tester, said hardness tester being conventional and having a head and an anvil connected to its base, a workpiece supported on said anvil and being raised thereon to contact the tip of said clamping nosepiece and be clamped thereby with a clamping force, said tester further comprising a penetrator recessed in said clamping nosepiece, said clamping nosepiece comprising:

attachment means to attach said clamping nosepiece to the head of the hardness tester, and

adjustment means coupled to said clamping nosepiece to adjust the position of the penetrator with respect to the tip of said clamping nosepiece to adjust the amount said penetrator is recessed in said clamping nosepiece,

wherein said adjustment means comprises a body attached to said head of the tester, said penetrator being fixedly attached to said body, a housing vertically adjustably coupled to said body, said nosepiece being coupled to said housing so that as said housing is vertically adjusted with respect to said body said nosepiece is adjusted with respect to said penetrator, the position of the penetrator being adjusted independent of the clamping force.

4,442,706
PROBE AND A SYSTEM FOR DETECTING WEAR OF REFRACTORY WALL

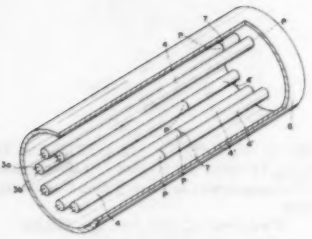
Yoshio Kawate, Toyonaka; Nobuyuki Nagai; Takefumi Horiuchi, both of Kobe; Saburo Tsurutani, Kawanishi; Minoru Kitamura, Nishinomiya; Shuzo Ito, Kobe; Masahiko Ohgami, Kakogawa; Kenichi Tochimori, and Toshio Inoue, both of Hyogo, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 1, 1982, Ser. No. 353,101

Claims priority, application Japan, Mar. 2, 1981, 56-29330[U]; Mar. 6, 1981, 56-32731; Mar. 11, 1981, 56-34738

Int. Cl.³ G01N *17/00*

U.S. Cl. 73—86 **10 Claims**



1. An apparatus for detecting the degree of wear of a refractory wall, comprising:

at least one probe adapted to be embedded in said wall, comprising,

plural sheathed probe elements each consisting of a pair of high melting point wires, said wires exhibiting a resistance low in thermal dependence and each pair of wires being formed of the same material, said wires having fore ends, said wires disposed in parallel and insulated from each other except at least the fore ends of said wires, said fore ends of each pair of wires forming a normally closed or normally open sensing point,

a sheath enclosure accommodating said probe elements such that the sensing points of the respective probe elements are located at different positions along the length of said sheath enclosure, and holding said probe elements in parallel relation and out of contact with each other, and

a number of dummy elements formed of a material similar to said probe elements and connected to the fore ends thereof to complement the lengths of the shorter of said probe elements.

4,442,707
METHOD AND CENTRIFUGAL APPARATUS FOR SLURRY EROSION TESTING

John J. Tuzson, Evanston, Ill., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 20, 1982, Ser. No. 451,556

Int. Cl.³ G01N *3/56*

U.S. Cl. 73—86 **11 Claims**

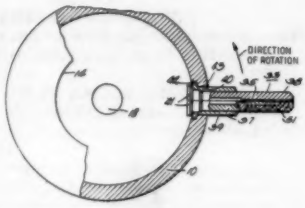
1. A centrifugal slurry erosion testing device including

a rotatable hollow cylindrical vessel,

means for feeding a slurry of abrasive particles into the interior of said vessel,

a specimen holder affixed to and extending radially from said vessel including first and second abutting members the first of which has a cavity in its abutting surface for receiving a specimen of material to be wear tested with a flat surface of the specimen facing the direction of rotation and the second member of which has a shallow, narrow radilly extending groove in its abutting surface which communicates with the interior of the rotating vessel and is disposed opposite said flat surface of said specimen and together therewith defines a radial passage for said slurry, and

means for rotating said cylindrical vessel at high angular velocity about its axis, whereby said slurry is urged by centrifugal force to flow through said passage and said



abrasive particles are urged by Coriolis acceleration into a compacted layer against said flat surface and remove material therefrom by scouring action to a measurable depth as the particles flow radially outward, which depth is indicative of the erosion resistance of said specimen.

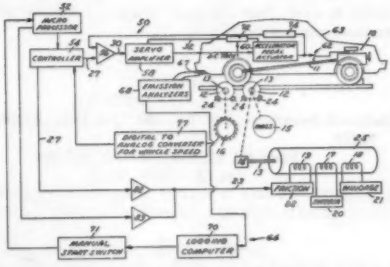
4,442,708
AUTOMATIC DRIVER SYSTEM

Stewart V. Gable, Ypsilanti, and Francis G. King, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 22, 1982, Ser. No. 421,556

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117 **6 Claims**



1. An automatic driving means for operating a vehicle having an accelerator pedal for controlling the throttle, the vehicle being mounted on traction rollers of a chassis dynamometer, said automatic driving means including:

accelerator pedal actuator means for moving the accelerator pedal;

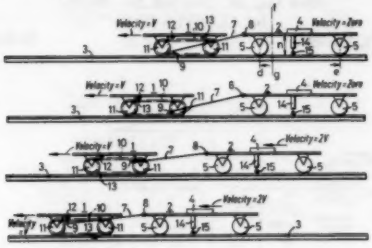
sensing means for sensing vehicle speed, accelerator pedal position and said accelerator pedal actuator means velocity; and

accelerator pedal control means for driving said accelerator pedal actuator means and being coupled to said sensing means for generating a triple loop accelerator pedal control signal using vehicle speed, accelerator pedal position and pedal actuator motor velocity feedbacks, so as to reduce throttle fluctuations.

4,442,709
MEASURING VEHICLES FOR ROADWAYS

John M. Waters, Derby, England, assignor to British Railways Board, England

Filed Sep. 1, 1981, Ser. No. 298,352
Claims priority, application United Kingdom, Sep. 5, 1980, 8028813
Int. Cl.³ E01B 35/00; B60D 1/00
U.S. Cl. 73—146 8 Claims

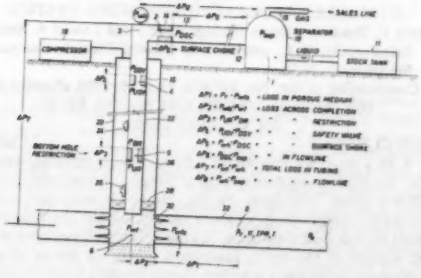


1. A measuring vehicle for roadways comprising a tow vehicle supported on the roadway, an instrument carrying vehicle supported on the roadway at two positions which are at a spacing from each other along the length of the instrument carrying vehicle and a connection between the tow vehicle and the instrument carrying vehicle comprising a connecting member extending between the two vehicles and a lost motion arrangement on the tow vehicle comprising rotatable guide means including at least one roller or sprocket connected to be rotated at a speed proportional to the speed of the tow vehicle and an endless belt or chain running on said guide means and driven by said roller or sprocket, said connecting member being connected to said belt or chain and the length of said belt or chain being proportional to said spacing so that as the tow vehicle moves continuously along the roadway the instrument carrying vehicle automatically remains stationary periodically and between each stationary period moves forward a distance proportional to said spacing.

4,442,710
METHOD OF DETERMINING OPTIMUM COST-EFFECTIVE FREE FLOWING OR GAS LIFT WELL PRODUCTION

Hai-Zui Meng, Sugar Land, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Mar. 5, 1982, Ser. No. 355,115
Int. Cl.³ E21B 49/00
U.S. Cl. 73—151 10 Claims



1. A method of determining the optimal cost-effective steady state production rate for a producing well as a function of predetermined well parameters associated with the production of a fluid from subsurface formations forming a reservoir containing the fluid, the fluid produced through a well production system having subsystems thereof and where the reservoir pressure performance is characterized by type curves, the method comprising the steps of:

(a) obtaining measurements of physical properties of the reservoir;

(b) determining reservoir pressure response functions as a function of production rate for various values of a first well parameter, each pressure response function in the form of well bottomhole inflow performance relationships developed from the measurements of the physical properties of the reservoir and the use of the type curves derived from a mathematical solution to a model representing the reservoir;

(c) obtaining the production system pressure response function for each subsystem in the production system;

(d) obtaining from production system responses a second set of functions for the fluid pressure at the well bottomhole as a function of production rate, said second set of functions obtained by varying a second well parameter while holding all other parameters constant;

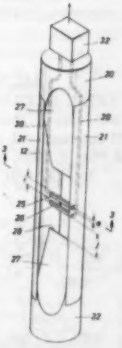
(e) obtaining a set of production rate response functions for various values of said second parameter where each production rate response function varies as a function of said first parameter; and

(f) analyzing said set of production rate response functions to determine the maximum cost-effective production rate as a function of the cost to obtain values of said first and second well parameters.

4,442,711
DEVICE FOR MEASURING THE FLOW OF FLUID IN A WELL

Jean-Pierre Hulin, Saint-Maur; Claude Fierfort, Lozere, and Roger Coudol, Clamart, all of France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Dec. 7, 1981, Ser. No. 327,973
Claims priority, application France, Dec. 18, 1980, 80 26875
Int. Cl.³ G01F 1/32
U.S. Cl. 73—155 28 Claims



1. A device for measuring the flowrate of fluid through a well, comprising an upper portion adapted for connection with a cable, two elongated side members, generally parallel to and spaced from each other and secured to said upper portion, a vortex generating assembly including at least one obstacle secured between said side members transversely of their longitudinal direction, said side members having, at least in the region of said assembly, facing walls which are substantially planar, defining an elongated structure substantially open along its length to the flow of fluid in the well when inserted on the cable into the well, and a transducer responsive to the

occurence of vortices generated by said assembly for producing a signal indicative of said flowrate.

4,442,712

METHOD AND APPARATUS FOR CORRECTING THE UNBALANCE PRESENT IN A ROTOR

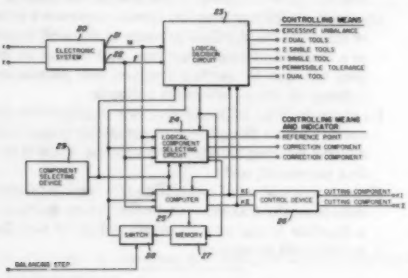
Günter Junck, Modautal; Hans Seidel, Rossdorf, and Jesus Varona, Darmstadt, all of Fed. Rep. of Germany, assignors to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik, Darmstadt, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,573

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107539

Int. Cl.³ G01M *1/38*

U.S. Cl. 73—462 15 Claims



1. A method of correcting the unbalance present in a rotor in the minimum number of correction steps comprising performing mass correction by adding or removing material only to or from given points on the rotor, with only a limited quantity of material being available for correction at each point, with the unbalance being resolved into correction components determined by the design of the rotor, the correction being carried out in at least one of several components of the rotor and the unbalance determined being eliminated in said components so as to permit the least quantity of material to be added or removed in a minimum number of correction runs so that finally an uninterrupted sequence of correction points is determined for the rotor.

4,442,713

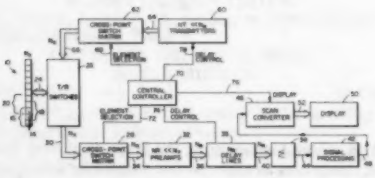
FREQUENCY VARIED ULTRASONIC IMAGING ARRAY

David A. Wilson, and James L. Buxton, both of Palo Alto, Calif., assignors to SRI International, Menlo Park, Calif.

Filed Mar. 9, 1982, Ser. No. 356,498

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—599 25 Claims



1. An ultrasonic imaging apparatus, which comprises an array of transducer elements for transmitting ultrasonic signals having a first predetermined center frequency into an object to be examined through use of the transmitted signals reflected from within the object and sensed by the apparatus, the reflected signals sensed by the apparatus having a second center frequency less than the first center frequency as a result of signal attenuation by the object, and means connected to select a number of transducers in said array for transmitting the ultrasonic signals inversely proportional to the second center frequency.

4,442,714

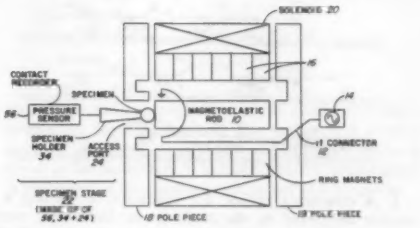
MICROSCOPE AND METHOD OF USE

Wayne L. Bongianni, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 18, 1981, Ser. No. 293,912

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—606 20 Claims



1. An acoustic microscope comprising in operable communication:

(a) a magnetoelastic transducer to which an rf feed is to be connected wherein said transducer is in the shape of a rod which has an axis of symmetry;

(b) means for producing a magnetoelastic wave within said magnetoelastic transducer, a part of which wave is an acoustic wave having a wavelength less than about 10 μm which is generated in response to an rf signal which impinges upon said transducer;

(c) means for producing a uniform magnetic field the absolute value of which can be varied along said axis of symmetry of said rod so as to physically focus said acoustic wave onto a specimen and so as to produce a reflected signal reflected by and representative of said specimen; and

(d) means for transducing said reflected signal to a corresponding rf signal which is representative of said specimen and which can be processed, wherein said means for producing a uniform magnetic field is such that it allows physical contact of said transducer with a specimen being examined and wherein said rf feed to be connected is such that it avoids distorting said acoustic wave.

4,442,715

VARIABLE FREQUENCY ULTRASONIC SYSTEM

Axel F. Brisken, Shingle Springs, Calif., and Lowell S. Smith, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 199,983, Oct. 23, 1980, abandoned. This application Oct. 20, 1982, Ser. No. 435,521

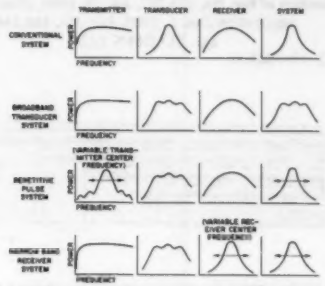
Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 2 Claims

1. In a steered beam, sector scan ultrasonic imaging system for medical examinations comprising a broadband linear phased array transducer having plural electroacoustic elements for transmitting pulses of ultrasound and for receiving echo signals, said transducer having a bandwidth greater than 40 percent of the center frequency when the power at any frequency in the band is no less than 6 decibels lower than the power at the frequency of maximum power, a transmitter for producing transducer excitation voltages which are fed to selected elements in sequence, a multichannel broadband receiver, a plurality of receiving channels each having an in-phase and a quadrature channel in which said echo signals are

coherently demodulated using emission frequency reference signals and are focused and summed to produce focused in-phase and quadrature signals, and a B-scan display device, said system having a radiative spectrum that is the product of the bandwidths of said transducer, transmitter, and receiver, the method of adjusting the system radiative spectrum which comprises:

varying the emission frequency of the pulses of ultrasound



between 2 and 5 megahertz, while examining the patient without changing said transducer, by exciting selected elements in sequence with an RF burst whose frequency is changed only between pulse transmissions, said RF burst frequency being varied over all or a portion of the transducer bandwidth; and

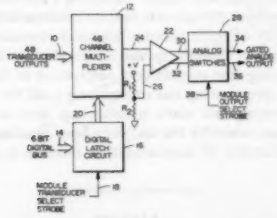
adjusting said receiving channel frequency reference signals between pulse transmissions to correspond with the RF burst frequency.

4,442,716

ELECTRONIC SCANNING PRESSURE MEASURING SYSTEM AND TRANSDUCER PACKAGE

Charles F. Coe, Los Altos, and Gilbert T. Parra, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Administrator of the National Areonautics and Space Administration, Washington, D.C.

Filed Apr. 30, 1982, Ser. No. 373,771
Int. Cl.³ G01L 9/06; G01M 9/00
U.S. Cl. 73—756 **13 Claims**



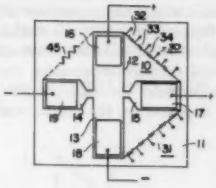
1. A pressure system comprising a plurality of pressure transducers, means for obtaining an electrical signal indicative of a pressure measurement from each of said plurality of pressure transducers, multiplexing means connected for selectively supplying inputs from said plurality of pressure transducers to said signal obtaining means, a data bus connecting said plurality of pressure transducers to said multiplexing means, a latch circuit connected to supply control inputs to said multiplexing means, an address bus connected to supply an address signal of a selected one of said plurality of pressure transducers to said latch circuit, said signal obtaining means comprising a differential amplifier receiving a first signal from one of said pressure transducers as a first input and a second signal from a predetermined one of said pressure transducers constituting a reference transducer as a second input, the differential amplifier producing as an output, based on said first and second signals, the electrical signal indicative of the pressure measurement.

4,442,717

COMPENSATION AND NORMALIZATION APPARATUS FOR SHEAR PIEZORESISTIVE GAGE SENSORS

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Franklin Lakes, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Sep. 20, 1982, Ser. No. 419,903
Int. Cl.³ G01B 7/18; G01D 3/04
U.S. Cl. 73—766 **17 Claims**



1. In a piezoresistive sensor of the type having a cross-shaped configuration including a central vertical arm having top and bottom contacts for receiving an excitation voltage and a horizontal arm located near the center of said vertical arm and relatively perpendicular thereto and having on each end a contact for providing an output voltage across said horizontal arm due to a current flow through said vertical arm and proportional to a force applied to a flexible diaphragm upon which said sensor is located, the combination therewith of apparatus for compensating and normalizing the output voltage, comprising:

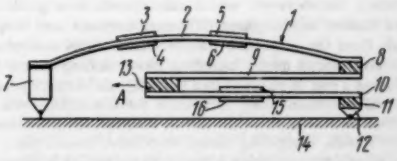
impedance means coupled between one of said arms and another of said arms of said sensor and operative to provide a compensated output whereby said output voltage from said sensor exhibits a predetermined null for a zero pressure condition over a specified temperature range.

4,442,718

STRAIN GAUGE AND ELECTRIC CIRCUIT FOR ADJUSTMENT AND CALIBRATION OF SAME

Galina N. Komarova, ulitsa Dugina, 4, kv. 15; Nadezhda P. Klokova, ulitsa Pushkina, 8, kv. 44; Boris P. Podboronov, Molodezhnaya ulitsa, 30, kv. 50, and Georgy M. Piskov, ulitsa Dugina 29, kv. 30, all of Zhukovsky Moskovskoi oblasti, U.S.S.R.

This PCT application filed Feb. 18, 1982, Ser. No. 355,561
PCT No. PCT/SU 80/00/09, § 371 Date Feb. 18, 1982, § 102(e) Date Feb. 18, 1982, PCT Pub. No WO 82/00054, PCT Pub Date Jan. 7, 1982
Claims priority, application U.S.S.R., Jun. 9, 1978, 2626337
Int. Cl.³ G01L 1/22
U.S. Cl. 73—766 **9 Claims**



1. A strain gauge comprising a tensoresistor sensitive element which interacts with a movable support through which a signal corresponding to the actual strain value is applied to the gauge, a thermoresistor compensating element and a mechanical thermocompensating element made of a material whose

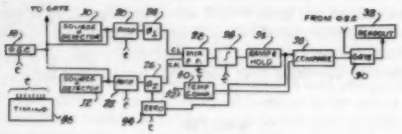
linear thermal expansion coefficient is about equal to the thermal expansion coefficient of the material of the article subjected to strain measurements and rigidly coupled to a second support and connected through the tensoresistor sensitive element to the movable support characterized in that it has a spacer element (9) separating the tensoresistor sensitive element (1) from the mechanical thermocompensating element (10) and made of a material whose linear thermal expansion coefficient is much lower than the thermal expansion coefficient of the material of the mechanical thermocompensating element (10), and in that a heater element (15) and a thermoresistor element (16) are arranged on the mechanical thermocompensating element (10) and intended for programmed straining of the mechanical thermocompensating element (10) in the course of the adjustment and calibration of the strain gauge after the latter is placed on the article which is to undergo testing.

4,442,719

ACOUSTIC FLOWMETER

Ollie J. Allen, 4037 High Point Rd., Ellicott City, Md. 21043, and Kelly M. Allen, 1015 Caren Dr., Sykesville, Md. 21784

Filed Jan. 11, 1982, Ser. No. 338,648
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.29 **21 Claims**



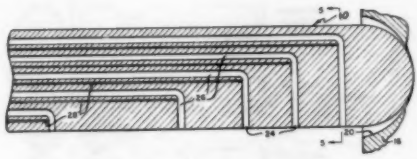
1. An improvement in a monitoring circuit for an acoustic flowmeter of the type including a pair of ultrasonic transceivers at facing, longitudinally spaced locations along a conduit for producing alternating electrical output signals, each in response to the other, said electrical signals differing in phase by an amount corresponding to the rate of fluid flow in said conduit, oscillator means for feeding a predetermined alternating electrical input signal to said transceivers, said monitoring circuit being coupled to said transceivers for receiving the output signals produced thereby and for producing responsive output signals which correspond to the rate of fluid flow, the improvement comprising: a pair of phase responsive circuit means responsive respectively to the two transceivers output signals for producing pairs of pulse signals having a phase difference therebetween which corresponds in a predetermined fashion to the phase difference between said output signals from the respective transceivers, both of said phase responsive circuit means including phase shifting means for producing a pair of phase-shifted pulse signals having a predetermined minimum phase difference therebetween, even in response to a zero phase difference between the transceiver output signals, comparing means responsive to said pairs of pulse signals for producing a gating signal having a duration which corresponds to the difference in phase between said pairs of pulse signals and gating means coupled to said oscillator means and responsive to said gating signal for gating through a portion of said predetermined alternating signal corresponding in a predetermined fashion to the rate of fluid flow through said conduit means.

4,442,720

SAMPLING DEVICE FOR WITHDRAWING A REPRESENTATIVE SAMPLE FROM SINGLE AND MULTI-PHASE FLOWS

Walter J. Apley, Pasco; William C. Cliff, and James M. Creer, both of Richland, all of Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 173,247, Jul. 29, 1980, abandoned. This application Jan. 6, 1983, Ser. No. 456,146
Int. Cl.³ G01N *1/26*
U.S. Cl. 73—863.31 **12 Claims**



1. A probe device for simultaneously obtaining a plurality of representative samples from a multi-phase fluid stream flowing through a well pipe, said fluid stream having a plurality of zones of pre-determined cross-sectional area to be simultaneously sampled, comprising:

a right cylindrical probe,

drive rod means coupled to said probe which may be positioned within said fluid stream by said drive rod means, the maximum extension of said probe limited by said well pipe containing said fluid stream, said probe capable of being removed completely from said fluid stream,

a plurality of sampling lines, each sampling line terminating in a port at the surface of said probe, said sampling ports in said probe lying along a diameter of said well pipe, each port being positioned in the probe so as to withdraw a sample from a pre-determined zone of said fluid stream, the area of each port proportional to the cross-sectional area of the zone of the fluid stream it samples,

means for measuring the differences in static pressure among said sampling ports, said means including a plurality of static pressure tap lines branching off the sampling lines respectively, and further including a plurality of differential pressure transducers in fluid communication with said plurality of static pressure tap lines respectively, and

a plurality of throttle means for regulating the pressure in each sampling line respectively responsive to the pressure in each static pressure tap line respectively until the differences in pressure among said static pressure tap lines are a predetermined value, whereby the sampling lines simultaneously withdraw a plurality of representative samples from said fluid stream.

4,442,721

MOISTURE AND CONSISTENCY SOIL SAMPLER

Laura G. Singer, 221 Riverview Ave., Highland Park, N.J. 08904

Filed Aug. 6, 1982, Ser. No. 405,879
Int. Cl.³ G01N *1/08*
U.S. Cl. 73—863.31 **2 Claims**

1. A generally unitary moisture and consistency soil sampler comprising,

a. a shaped elongated member having, an inserting end, and a handle end remote from the inserting end,

b. said elongated member having a plurality of serially spaced generally transverse means defining continuously open soil collecting pockets along the elongated member near the inserting end,

c. each of said means defining the soil collecting pockets including, at least two coacting and spaced transverse

surface means to define a spaced opening therebetween for collecting soil in the soil collecting pockets,

d. said means defining each of the soil collecting pockets also including, a concave shaped section in said shaped elongated member forming an associated recess means for each of the said collecting pockets in communication with

the respective spaced opening defined by the transverse surface means, and

e. each said concave shaped section terminating in substantially diametrically opposed shaped side edges to facilitate collection of soil during use of the moisture and consistency soil sampler.

4,442,722

PLUNGER OPERATED PIPET

Richard C. Meyer, La Habra, Calif., assignor to Beckman Instruments Inc., Fullerton, Calif.

Continuation of Ser. No. 351,568, Feb. 23, 1982, abandoned, which is a continuation of Ser. No. 165,908, Jul. 3, 1980, abandoned. This application Jan. 7, 1983, Ser. No. 456,201

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—864.18 **1 Claim**

1. Pipetting apparatus comprising:

a generally tubular body having an open forward end for receiving and expelling fluid;

a plunger supported for axial movement in the body to draw fluid into and expel fluid from the body with axial movement away from and toward the open end;

stop means movable between first and second locations in the body to halt movement of the plunger in one direction at first and second axial positions thereby establishing different stroke lengths of plunger movement in the body;

spring means for driving the stop means in one direction between the first and second locations;

arming means for energizing the spring means;

means for retaining the stop means in one of the first and second locations against action of the spring means; and

release means responsive to plunger movement away from the forward end during a first plunger stroke following energizing of the spring means for disabling the retaining means and allowing the spring means to drive the stop means to the other of the first and second locations whereby the first plunger stroke and the succeeding plunger stroke are of the different stroke lengths.

4,442,723

NORTH SEEKING AND COURSE KEEPING GYRO DEVICE

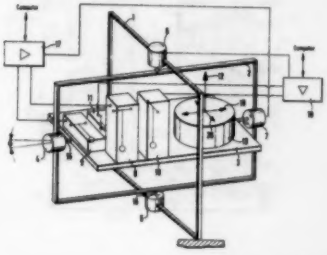
Werner Auer, Wiesenbach, Fed. Rep. of Germany, assignor to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

Filed Nov. 27, 1981, Ser. No. 325,186

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045507

Int. Cl.³ G01C *19/30, 19/38*

U.S. Cl. 74—5.47 **7 Claims**



1. In a gyro device arranged to be mounted in a vehicle and operable selectively as a directional gyro or as a gyro compass, which device includes:

a gyro component including a rotor rotatable about a spin axis;

a precession gimbal supporting the gyro rotor via its spin axis and pivotal about a precession axis;

first and second position sensors mounted for providing respective signals representing the inclination of the precession gimbal relative to the horizontal about each of two mutually perpendicular axes which are both perpendicular to the rotor spin axis, the first sensor providing an inclination representing signal relative to that one of the two axes which is parallel to the precession axis;

a second gimbal supporting the precession gimbal via its precession axis and pivotal about a pivot axis which is perpendicular to the precession axis;

a housing supporting the second gimbal via its associated pivot axis;

first drive means connected for pivoting the second gimbal about its pivot axis in response to signals from one of the position sensors,

control means connected for calculating the north deviation angle of the device relative to a reference direction in response to signals generated by the gyro component; the improvement wherein:

said gyro component generates signals relative to two measuring directions;

said second gimbal is mounted with its pivot axis oriented substantially vertically;

said device further comprises second drive means connected to receive the signal from said first position sensor and for pivoting said precession gimbal about the precession axis into a position in which the gyro rotor spin axis is parallel to the pivot axis of said second gimbal;

the signal provided by said second position sensor is representative of the inclination of said precession axis to the horizontal; and

said device further comprises switching means for effecting pivoting of said precession gimbal about the precession

axis to bring the spin axis of said rotor into a horizontal orientation for permitting operation of said device as a directional gyro.

4,442,724

ROTARY DIAL UNIT

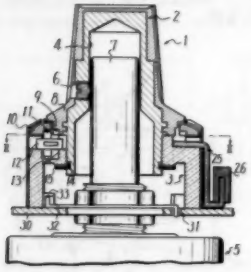
Masami Nirasawa, and Hideo Nigara, both of Kawasaki, Japan, assignors to Sakae Tsushin Kogyo Co. Ltd., Japan

Filed Mar. 12, 1981, Ser. No. 242,979

Claims priority, application Japan, Nov. 13, 1980, 55-162306[U]

Int. Cl.³ F16H *35/18*; G05G *5/06*

U.S. Cl. 74—10.41 **4 Claims**



1. A rotary dial unit comprising:

(a) a knob fixed to a rotary shaft to be rotatable therewith;

(b) a dial mechanism provided in association with said knob;

(c) a base for rotatably supporting thereon said knob and said dial mechanism;

(d) clamp means provided between said knob and said base; said clamp means consistingg of a brake shoe formed on a top surface of said base integral therewith, which is in contact with a lower surface of said knob, and a brake lever having a projection, said clamp means being so constructed that when said brake lever is rotated in its operating direction, said projection engages with said brake shoe to thereby urge said brake shoe against the lower surface of said knob to clamp said knob at a predetermined position, and

in which said brake shoe is formed by providing a slit in one of inner and outer flanges which are provided on the top surface of said base integrally therewith, said brake lever is formed to be of a substantially semi-circular shape which is rotatably located within a groove defined by said inner and outer flanges and the top surface of said base, and said projection is provided at one of free ends of said semi-circular brake lever.

4,442,725

SHOCK ABSORBING APPARATUS FOR TRAVELLING A TABLE OR TOOL REST IN MACHINE TOOLS

Hirokuni Urabe, Fukuyama, Japan, assignor to Shigiya Machinery Works, Ltd., Japan

Filed May 26, 1981, Ser. No. 266,765

Int. Cl.³ F16H *1/08*

U.S. Cl. 74—89.15 **4 Claims**

1. A shock-absorbing apparatus for sliding tables in machine tools, the table having a feed nut and a feed screw and being adapted to be moved by said feed nut mounted on said feed screw, comprising:

(a) a rigid bracket disposed on said feed screw,

(b) a sliding collar disposed on said rigid bracket,

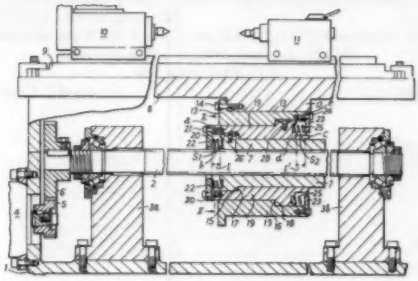
(c) a bushing disposed on said sliding collar,

(d) opposing staged notches on one of the rigid bracket and sliding collar or on the sliding collar and bushing, and further comprising:

(e) means for pressing the opposing staged notches of two adjacent parts against one another and thus prebiasing the parts against one another, characterized in that:

(f) said feed nut (7) serves as said rigid bracket,

(g) a table (8) in engagement with said bushing (13) adapted to be moved by rotating said feed screw (2); and



(h) a tongue and groove configuration between one of said feed nut (7) and sliding collar (10) or between the sliding collar (19) and bushing (13) to prevent rotational movement of these parts.

4,442,726

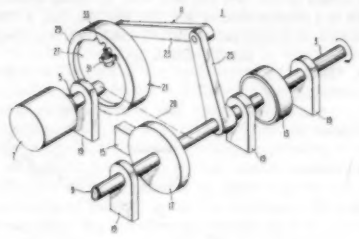
ADJUSTABLE STROKE ROTARY INDEXING MECHANISM

Michael J. Poccia, Rochester, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 16, 1981, Ser. No. 243,976

Int. Cl.³ F16H *29/04*

U.S. Cl. 74—117 **9 Claims**



1. An apparatus for providing intermittent rotary output motion of adjustable angular stroke comprising:

a rotatable input shaft;

an intermediate shaft disposed in spaced parallel relationship with said input shaft, said intermediate shaft being drivably and mechanically coupled to said input shaft, said mechanical coupling yielding oscillatory motion in said driven intermediate shaft when said input shaft is driven at a constant angular speed;

said mechanical coupling between said input shaft and said intermediate shaft comprising an adjustable length crank mounted on said input shaft, a rocker link mounted on said intermediate shaft and a coupler link pivotably connected on its first end to said crank and on its second end to said rocker link, said mechanical coupling being dimensionally configured to be operated as a crank-rocker planar four-link mechanism for a predetermined set of crank length adjustments;

said adjustable length crank comprising a first member mounted on said input shaft and a second member rotatably mounted with respect to said first member, said second member being lockably engagable with said first member such that when said second member is locked, it will rotate

with said first member, but when said second member is unlocked, it will be rotatable with respect to said first member; said second member being pivotably connected to said first end of said coupler link;

a rotatable output shaft coupled to said intermediate shaft by a one-way clutch, said output shaft having an angular stroke such that said output shaft is driven with said intermediate shaft in one cycle of said intermediate shaft's oscillatory stroke; and

means for adjusting the angular stroke of said output shaft comprising a brake for securing in place said intermediate shaft and said rocker link mounted on said intermediate shaft and drive means for turning said input shaft and said first member mounted on said input shaft.

4,442,727

CONTROL MEANS FOR ROTARY POWER TRANSMISSION

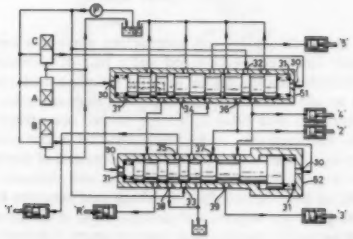
Alastair J. Young, 39 Roundshill, Kenilworth, England, assignor to Alastair John Young, Leamington Spa, England

Filed Sep. 16, 1981, Ser. No. 302,533

Claims priority, application United Kingdom, Oct. 29, 1980, 8034839

Int. Cl.³ F16H *5/52, 5/42;* B60K *41/16*

U.S. Cl. 74—336 R **6 Claims**



1. Control means for a rotary transmission having an input and an output and at least first, second and third gear trains in a series, selection means for individually selecting each gear train, a first clutch arranged to selectively connect the input with the output through an odd numbered gear train in the series selected by its selection means, a second clutch arranged to selectively connect the input with the output through an even numbered gear train in the series selected by its selection means, the control system comprising:

a fluid pressure source,

at least three fluid pressure operable actuation means, one for operating each of said selection means,

two single-spool valves having inlets connected from said pressure source and outlets connected to said actuation means and having control ports,

three solenoid operated valves arranged to supply fluid from said source selectively to said control ports to control the spool valves and thereby control distribution of pressure to said actuation means for operation of said selection means for selection of gear trains two at a time in overlapping pairs.

4,442,728

CLUTCHED MULTIPLE BRANCH GEAR TRANSMISSION SYSTEM AND METHOD

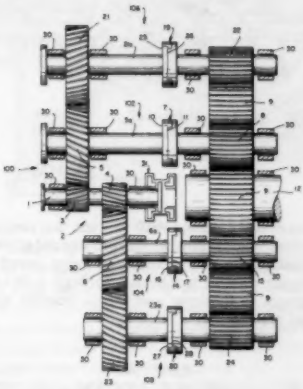
Ernst Jahnel, Augsburg, Fed. Rep. of Germany, assignor to Zahnraderfabrik Renk A.G., Augsburg, Fed. Rep. of Germany

Filed Jun. 22, 1981, Ser. No. 276,199

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1980, 3023283

Int. Cl.³ F16H *3/14*

U.S. Cl. 74—361 **16 Claims**



1. A transmission system comprising an input shaft, input gear means, means mounting the input gear means to the input shaft, the input shaft rotating the input gear means, an output gear, a pair of lay shaft gear trains, each lay shaft train including a spur gear, each spur gear being in engagement with the input gear means, each lay shaft train further including pinion means, each lay shaft pinion means being in driving engagement with the output gear, each lay shaft train further including clutch means intermediate the spur gear and the pinion means, the transmission further including adjustable bearing means, the input shaft engaging the adjustable bearing means, the adjustable bearing means including means for selectively varying the bearing play during different stages of clutch operation, the means for varying the bearing play including means for selectively providing a restraintive force inhibiting bearing movement and for selectively relieving the restraintive force to permit increased bearing play.

4,442,729

LUBRICATING SYSTEM FOR FOUR-WHEEL DRIVE TORQUE TRANSFER MECHANISM

Yoichi Hayakawa, Toyoake, Japan, assignor to Aisin Warner Kabushiki Kaisha, Aichi, Japan

Filed Oct. 6, 1981, Ser. No. 309,141

Claims priority, application Japan, Oct. 7, 1980, 55-140022

Int. Cl.³ F16H *1/44, 57/04*

U.S. Cl. 74—467 **13 Claims**

1. In a torque transfer mechanism mounted as a separate unit on the rear end of a transmission disposed next to an engine of a vehicle, the improvement therein comprising:

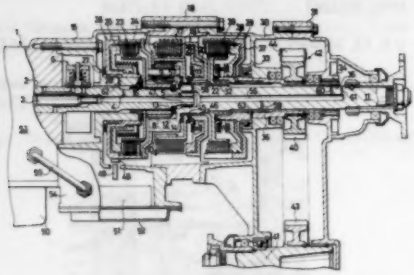
a common shaft functioning simultaneously as the output shaft of said transmission and the input shaft of said torque transfer mechanism;

a first output shaft of said torque transfer mechanism, said common shaft and said first output shaft being supported rotatably and disposed coaxially with each other;

a planetary gear train positioned between said common shaft and said first output shaft for selectively transmitting the rotational speed of said common shaft to said first output shaft with two different gear ratios, said gear train includ-

ing a sun gear fitted onto said common shaft, pinions engaged with said sun gear, a ring gear engaged with said pinions and a carrier rotatably supporting said pinions thereon and connected to said first output shaft;

a lubricating system including lubricating oil passages communicating with each other and formed along the central



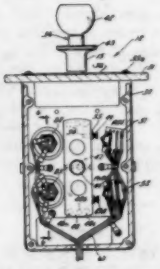
portions of said common shaft and said first output shaft of said torque transfer mechanism, pressurized lubricating oil contained within said transmission being introduced into said torque transfer mechanism through said lubricating oil passages to lubricate said torque transfer mechanism and said planetary gear train.

4,442,730

VEHICLE TRANSMISSION SYSTEM AND A SINGLE LEVER CONTROL DEVICE THEREFOR

Joseph B. Snoy, Rockford, Ill., assignor to Twin Disc, Incorporated, Racine, Wis.

Filed Aug. 31, 1981, Ser. No. 297,827
Int. Cl.³ B60K *41/22*; G05G *9/12*
U.S. Cl. 74—475 **10 Claims**



2. In combination:

a transmission having an input shaft, an output shaft and a plurality of solenoid-operable clutches operable to put the transmission in any one of a plurality of ranges in either forward or reverse;

a plurality of solenoids connected for operating said clutches; and means for operating said solenoids comprising a control circuit connected to effect energization of said solenoids and a single lever control device;

said single lever control device comprising a support structure and a lever pivotably movable along a first path from neutral position in opposite directions to either a forward position or a reverse position, and said lever being further pivotably movable along another path transverse to said first path in opposition directions between two positions when in forward position or reverse position,

first and second switches connected to said control circuit and responsive to placement of said lever in forward and reverse position, respectively, to place said control circuit in readiness to effect forward or reverse shifting, respectively;

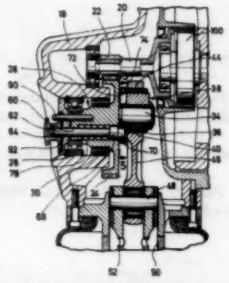
third and fourth switches connected to said control circuit and responsive to movements of said lever along said other path to effect upshift or downshift of said transmission in forward or reverse; first releasable means for maintaining said handle in forward or reverse positions; and second releasable means including a detent on said handle releasably engageable with said support structure for maintaining said handle in neutral position.

4,442,731

CRANK DRIVE FOR SOIL COMPACTING APPARATUS

Hans Bürger, Esslingen, Fed. Rep. of Germany, assignor to Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co., Esslingen, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 281,224
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1980, 3025667; May 27, 1981, 3121007
Int. Cl.³ G05G *1/00*
U.S. Cl. 74—571 R **14 Claims**



1. A crank device for soil compacting apparatus having a crankshaft and a connecting rod and a pair of eccentric elements rotatable about parallel axes for coupling said connecting rod to said crankshaft, said eccentric elements being lockable relative to each other to set the overall eccentricity provided by said elements, characterized in that a first eccentric element is provided with a plurality of recesses and the second element is provided with a locking bolt, said elements being rotatable to relative positions at which said recesses respectively are generally aligned with said bolt, and means mounting said bolt on said second element for movement between a first position at which it can enter a first recess generally aligned therewith and cannot enter a second recess and a second position at which it cannot enter said first recess and can enter said second recess generally aligned therewith.

4,442,732

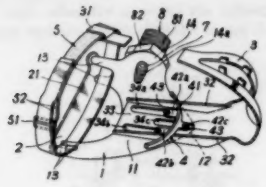
PEDAL FOR A BICYCLE

Shinpei Okajima, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 73,859, Sep. 10, 1979, abandoned. This application Feb. 27, 1981, Ser. No. 238,964
Claims priority, application Japan, Sep. 22, 1978, 53-130803; Sep. 22, 1978, 53-130804; Sep. 22, 1978, 53-130805; Sep. 22, 1978, 53-130806; Sep. 22, 1978, 53-130807
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—594.5 **6 Claims**

1. A pedal for a bicycle, having a pedal body and a bearing mechanism for rotatably supporting said pedal body to a crank arm, the pedal body being equipped with a toe clip and a toe strap, said pedal body being displaced downwardly with respect to an axis of rotation of said bearing mechanism, and having at opposite longitudinal ends a front side-plate and a

rear side-plate, each having a respective foot bearing surface, said pedal body having a substantially triangular shaped forward extension extending forwardly of said axis, said extension having an upper surface and a bottom surface which tapers away from said upper surface in a direction of moving away



from a fore end of said extension, said bottom surface of said extension being in continuation of and forming part of a bottom surface of said pedal body, said front side-plate being mounted on said extension and being curved forward along the outer edge of said extension.

4,442,733

TRANSMISSION CENTER SUPPORT MOUNTING

James F. Hartz, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 28, 1982, Ser. No. 392,894
Int. Cl.³ F16H *57/04, 57/02;* **F02F** *5/00;* **F16C** *9/00*
U.S. Cl. 74—606 R **3 Claims**

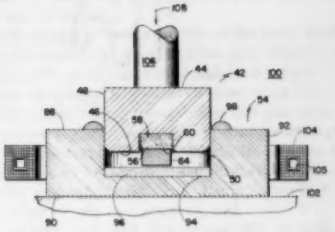
1. In a transmission having a range of operating temperatures above ambient and including a case having a main bore, a center support disposed in a non-rotatable assembled position in said main bore with a cylindrical surface thereof cooperating with said main bore in defining an annular gap, fluid supply means in said case intersecting said main bore, and passage means in said center support intersecting said cylindrical surface and registering with said fluid supply means in said assembled position of said center support, the improvement comprising elastomeric centralizing and sealing means including a plurality of spacer portions arranged around said center support and disposed in compression in said gap at ambient temperature so that radially directed balanced forces are exerted on said center support by said spacer portions operative to centralize said center support in said main bore, said centralizing and sealing means having a coefficient of thermal expansion sufficiently exceeding the coefficient of thermal expansion of at least one of said case and said center support to maintain said compression throughout said operating temperature range so that said center support is centralized throughout said operating temperature range, and means on one of said plurality of compressed spacer portions defining a gasket between said center support and said main bore permitting fluid tight communication between said fluid supply means and said passage means.

4,442,734

METHOD FOR MOUNTING HARD WEAR-RESISTANT INSERTS

Charles Carson, Fort Wayne, Ind., assignor to Fort Wayne Wire Die, Inc., Fort Wayne, Ind.

Filed May 28, 1982, Ser. No. 383,207
Int. Cl.³ B21K *5/20*
U.S. Cl. 76—107 A **17 Claims**



1. In a method of mounting a hard insert element including the steps of providing a cylindrical metal casing with opposite front and back sides, the casing having a cylindrical cavity formed in the front side with a flat bottom spaced from the back side, providing a cylindrical plug having top and bottom ends and proportioned to have a close fit in the caity, positioning an insert element in the casing cavity adjacent the bottom thereof, inserting the plug in the casing cavity with the bottom end thereof spaced from the cavity bottom with the die element located in the space, securing the plug in the cavity and the insert element in the space, and forming tapered openings in the top end of the plug and the bottom side of the casing respectively communicating with the insert element, the plug-casing assembly having a reference position with the casing cavity bottom facing upwardly and the plug bottom end facing downwardly, the improvement comprising: prior to inserting the plug in the cavity, inverting one of said plug and casing so that one of said plug bottom end and casing cavity bottom is inverted from its reference position; centering said insert element with respect to the inverted one of said plug bottom end and casing cavity bottom and adhering said insert element thereto; and again inverting said one of said plug and casing to said reference position.

4,442,735

CHAMPAGNE CORK PULLER

Allan Chance, 100 Eldridge St., Mill Valley, Calif. 94941, and William T. Gray, 19612 Grandview Dr., Topanga, Calif. 90290

Filed Nov. 24, 1982, Ser. No. 444,406
Int. Cl.³ B67B *7/06;* **B65D** *39/00*
U.S. Cl. 81—3.44 **20 Claims**

1. A device for removing a stopper from a container having a ridged neck, said device comprising:

a body having a top and opposed leg portions each joined at an upper end to said top, said leg portions having an upper and a lower inner ledge portion, said upper ledge portions being located longitudinally of said body at a distance below said top to enable the stopper to be clinched between said upper ledge portions and said top, said lower ledge portions being located longitudinally of said body at

a distance below said top to provide a limit stop with the ridged container neck during removal of the stopper; and

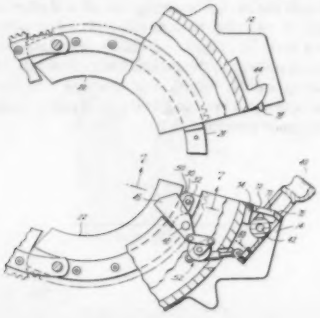
means for enabling said body to be arranged about the stopper and container neck.

4,442,736

POWER PIPE TONG ROTARY PLUNGER INSERTER

Martin E. True, and Terry D. Timmerman, both of Houston, Tex., assignors to Weatherford/Lamb, Inc., Houston, Tex.

Filed Sep. 9, 1982, Ser. No. 416,405
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.15 **9 Claims**



1. In a power pipe tong including doors with a latch handle and having a circular rotary having connecting ends for opening and closing for receiving pipe for make-up or break-out in which the connecting ends of the rotary are fastened together by a spring loaded plunger, the improvement in means for inserting the plunger into the connecting ends as the tong doors are closed comprising,

a cam pivotally mounted on the tong and positioned for engagement with the top of the plunger for inserting the plunger into the rotary and for releasing the plunger, and

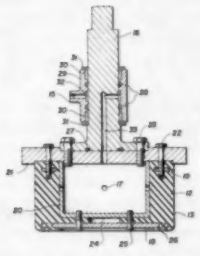
a connecting linkage mechanism connected between the cam and the door latch handle and actuated by the handle for moving the cam into engagement with the plunger when the latch is closed and for moving the cam out of engagement with the plunger when the latch is opened.

4,442,737

THREAD PROTECTOR WRENCH

Robert M. Miner, P.O. Box 373, Casper, Wyo. 92602

Filed Apr. 14, 1982, Ser. No. 368,159
Int. Cl.³ B25B *15/00*
U.S. Cl. 81—448 **7 Claims**



1. A wrench for removing generally cylindrically shaped thread protector members having two generally cylindrical surfaces, namely a grasping surface and a threaded surface, the latter being adapted to screw on the threads at the end of a pipe section, said wrench, comprising in combination,

a rotary drive shaft adapted to rotate about the axis of a pipe section having a thread protector screwed thereon to remove the thread protector by unscrewing it,

a generally cylindrical resilient boot member coupled to turn with said drive shaft having a cylindrical surface positionable to abut the grasping surface of the thread protector, and

a housing engaging said boot member and said shaft to rotate therewith providing about said boot member a chamber for retaining and releasing fluid under pressure adapted with the boot member in place abutting the grasping surface to exert pressure against said boot member thereby to urge the boot member abutting surface into contact with substantially uniform pressure about the entire circumference of the grasping surface of the thread protector.

4,442,738

AUTOMATIC PUSH-TO-START SCREWDRIVER

Bob B. Spencer, Reno, Nev., assignor to Standard Pneumatic Motor Co., a Division of Hamilton Company, Reno, Nev.

Filed Mar. 29, 1982, Ser. No. 362,982
Int. Cl.³ B25B *23/14*
U.S. Cl. 81—470 **43 Claims**

1. An automatic push-to-start machine for automatically driving a threaded fastener into a work piece in response to engagement pressure between the threaded fastener and the work piece, comprising

a housing,

motor means,

a torque responsive clutch,

a rotary drive means interconnected with the motor means through the torque responsive clutch,

a fastener holder arranged adjacent the rotary drive means, the rotary drive means and holder being movable relative to each other,

a magazine mountable on the housing for providing a supply of fasteners,

gate means for regulating passage of individual fasteners from the magazine to the holder, and

control means operatively coupled with the motor means, the torque responsive clutch, the relatively movable combination of the rotary drive means and holder and the gate means, the control means including means for functioning automatically in response to push-to-start engagement of the fastener with the work piece for

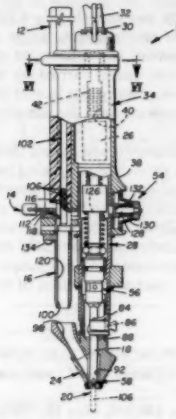
(a) initiating operation of the motor means through the

torque responsive clutch and rotary drive means to rotate the fastener

(b) terminating operation of the motor means when a predetermined torque level is sensed by the clutch,

(c) causing a subsequent fastener to be released from the magazine,

(d) shifting the holder and the rotary drive means relative to each other for allowing the subsequent fastener to enter into alignment with the rotary drive means,



(e) returning the holder and rotary drive means to a position where the holder secures the fastener in engagement with the rotary drive means, and

(f) thereafter returning the control means to the condition prior to step (a) whereby the machine is automatically conditioned for driving the subsequent fastener upon push-to-start actuation thereof.

4,442,739

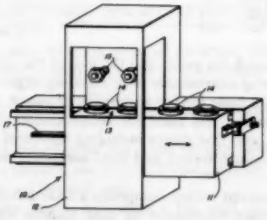
MULTI-SPINDLE WORK TRANSFER DEVICE

Sven V. Swanson, Jr., New Britain, and Richard G. Swanson, West Hartford, both of Conn., assignors to Litton Industrial Products, Inc., New Britain, Conn.

Filed Jun. 21, 1982, Ser. No. 390,178

Int. Cl.³ B23B *13/04*

U.S. Cl. 82—2.5 **2 Claims**



1. A machine tool comprising

a base having a work zone including a machine drive gear and tool means for performing a machining operation,

a work shuttle assembly including a pair of work stations each having at least one work spindle having a drive gear and an idler gear operatively associate with said spindle drive gear,

means for mounting said work shuttle assembly on said base for displacement between first and second positions selected to alternately locate each of said work stations at said work zone and at a load/unload zone, and

means for displacing said shuttle between said first and second positions,

means for presenting each of said work spindles at a predetermined orientation at said work and load/unload zones including

a gear rack mounted on said base for engaging each of said idler gears as said shuttle is displaced from one to the other of said positions,

said gear rack having at least a portion of the teeth thereof removed proximate said machine drive gear whereby the idler gear of the station located at said work zone will be operatively associated with said machine drive gear but will not be operatively associated with said gear rack,

means for preventing the rotation of said machine drive gear as said work shuttle assembly is displaced between said two positions and for allowing the rotation of said machine drive gear when said work shuttle assembly is located at either of said two positions, and

means for locking said work shuttle assembly at either of said two positions, and

means for driving the work spindle located at said work zone including said machine drive gear.

4,442,740

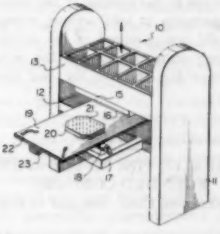
APPARATUS AND METHOD FOR PRODUCING SLITTED PLASTIC PRODUCE WRAPPERS

Thomas R. Rayton, Calgary, Canada, assignor to 236913 Alberta Ltd., Calgary, Canada

Continuation-in-part of Ser. No. 202,603, Oct. 31, 1980, abandoned. This application Sep. 23, 1982, Ser. No. 422,133

Int. Cl.³ B26F *1/18*

U.S. Cl. 83—29 **7 Claims**



1. A method for producing thin, pliable plastic produce wrappers having a central slit area bounded by a solid, unslit margin which comprises the steps of

(a) disposing a die having a plurality of upwardly projecting blades having a thickness of about 0.01 to 0.02 inch on the surface of a support moveable horizontally between a vertically moveable upper ram and a lower platen of a punch press, the bottom face of the ram having a resilient pad,

(b) laying a stack of at least 40 thin, pliable plastic sheets on said die,

(c) moving said support horizontally to bring said die into vertical alignment with said ram,

(d) activating said ram to press down on the plastic sheets resting on the die, thereby cutting slits through the entire stack of sheets,

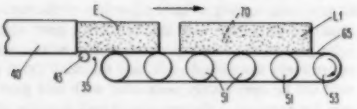
(e) moving said support out of vertical alignment with the ram and

(f) removing the stack of slitted wrappers from the die.

4,442,741
MEAT LOG CUTTER

Thomas D. Whittingham, 1127 N. Chester Rd., West Chester, Pa. 19380; William G. Hennig, 2146 Toluka Way, Boise, Id. 83702, and Thomas A. Brahler, 119 Governor Ct., Downingtown, Pa. 19335

Filed Sep. 7, 1982, Ser. No. 415,269
Int. Cl.³ B26D *5/38*
U.S. Cl. 83—80 **10 Claims**



1. In cooperative association with a minced meat extruder having motor driven discharge conveyor means extending forwardly from the discharge end of the extruder, a cutting mechanism between the discharge end of the extruder and the conveyor for cutting continuous extrusions of minced meat into logs of preselected length, said cutting mechanism comprising:

a. a double-acting fluid cylinder having a piston;

b. support means for supporting the fluid cylinder and piston in vertical position above the discharge end of the extruder;

c. a cutter;

d. means connecting the end of the piston to the cutter;

e. sensing means positioned along the discharge conveyor at a preselected distance from the discharge end of the extruder for sensing the arrival of the front end of the meat extrusion;

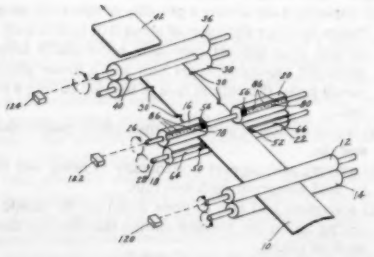
f. means responsive to the sensing of the arrival of the front end of the extrusion at said sensing means location for actuating said fluid cylinder to drive the cutter transversely through the meat extrusion to form a meat log; and

g. means responsive to the sensing of the arrival of the front end of the extrusion at said sensing means location for speeding up the travel speed of the conveyor means to create a spaced distance between the severed rearward end of the meat log and the forward end of the meat extrusion.

4,442,742
ROTARY APPARATUS FOR FORMING SHEETS WITH ROUNDED CORNERS

Ralph S. Orlow, Anaheim, Calif., assignor to Box Innards, Inc., Orange, Calif.

Filed Dec. 29, 1981, Ser. No. 335,580
Int. Cl.³ B26D *1/56*
U.S. Cl. 83—303 **3 Claims**



1. In pad forming apparatus, rotary edge notching apparatus comprising, in combination:

two pairs of parallel rollers on respective shafts adapted for rotation in opposite directions;

a respective punch member secured to one roller of each pair,

each punch member having a portion of a configuration to be removed from the edges of material to be passed between the rollers, each of such portions projecting from the lateral surface of a respective one roller of each pair; and

respective female die means carried by the other roller of each pair,

each female die means including a radially movable element of said configuration; guide means surrounding each said element and defining an opening of said configuration; and means carried by said other roller of each pair to resiliently bias its said element to a position wherein it projects from the lateral surface of said other roller,

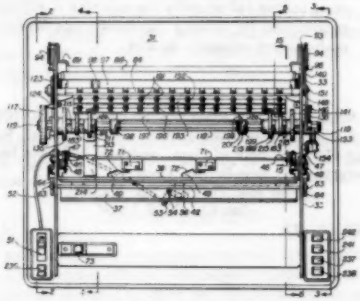
said punch members and female die means being operable upon sheet material being passed between said pairs of rollers so that said punch members depress said elements into said openings along with a portion of the material of said configuration,

said resilient biasing means and said elements being operable upon separation of said punch members and said elements to eject said portions of the material.

4,442,743
PUNCHING MACHINE

Elmer G. Szanto, Saratoga, Calif., assignor to Velo-Bind Inc., Sunnyvale, Calif.

Division of Ser. No. 150,049, May 15, 1980, Pat. No. 4,354,783. This application Apr. 23, 1982, Ser. No. 371,232
Int. Cl.³ B26D *7/01, 5/28*; B26F *1/02*
U.S. Cl. 83—372 **6 Claims**



1. In a punch for paper and the like of the type having first means forming a throat into which leading edges of papers may be inserted, a plate having a plurality of punch means, second means mounting said plate for reciprocation relative to said first means, said first means including apertures for reciprocation of said punch means, and third means for reciprocation of said plate,

the improvement which comprises a slide having a stop, said stop limiting movement of said leading edges into said throat, fourth means mounting said slide relative to said throat means for movement of said stop toward and away from the path of said punch means, and selector means for moving said slide, whereby said selector means determines the location of holes punched by said punch means relative to said first edges, said selector means comprising a lever pivoted about an axis parallel to the path of said punch means relative to said first means, means interconnecting said slide and said lever, and manually actuated means for pivoting said lever, said manually actuated means compris-

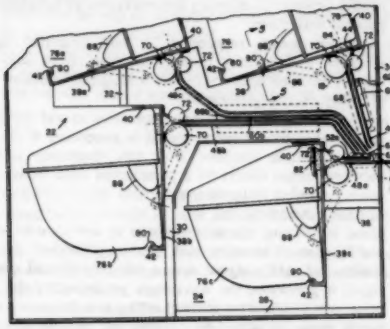
ing a selector slide and a flexible cable interconnecting said selector means and said lever.

4,442,744

APPARATUS FOR SUPPLYING PHOTOGRAPHIC SHEET MATERIALS, FOR USE IN A DARKROOM

Gary E. Raymond, 755 S. Rainbow Dr., Hollywood, Fla. 33021

Filed Nov. 30, 1981, Ser. No. 325,964
Int. Cl.³ B26D *5/08*
U.S. Cl. 83—614 **14 Claims**



1. Apparatus for supplying photographic sheet materials, for use in a darkroom, comprising:

a housing having a material-discharging opening formed therein;

means fixed within said housing for supporting a plurality of sheet material cassettes;

said supporting means comprising means defining a plurality of platforms;

chutes mounted within said housing for conveying photographic sheet materials therealong from said platforms to said opening; and

means mounted in said housing in adjacency to said chute, operative for gripping photographic sheet materials and moving such materials along said chutes to said opening; wherein

said platforms comprise means for gripping opposite sides of sheet material cassettes; and further including

means coupled to said supporting means for latchingly engaging sheet material cassettes and securing them to said platforms; and

a given plurality of sheet material cassettes; wherein

said platforms comprise a same given plurality as said cassettes;

each one of said cassettes being disposed upon one of said platforms;

each of said cassettes having a flat bearing surface at a forward end thereof, and means defining a relief at the opposite, rear end thereof; and

said gripping means comprises a flat wall in confronting, frictional engagement with said flat bearing surface of a cassette disposed on the respective platform, and a rib in fast engagement with said relief of such disposed cassette; wherein

each of said cassettes has means formed thereon defining a prominent land; and

said latchingly-engaging means comprises a latch, movable relative to said supporting means, having a limb which, upon said latch being moved, effects a compressive engagement, and releasing disengagement, with said land.

4,442,745

LONG DURATION APERIODIC MUSICAL WAVEFORM GENERATOR

Glenn Gross, Chicago, and Douglas R. Moore, Vernon Hills, both of Ill., assignors to Norlin Industries, Inc., White Plains, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,286
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **19 Claims**

1. In an electronic musical instrument of the type having a memory with a plurality of sample point waveform amplitude instructions stored at respective addresses therein, a counter for accessing said memory addresses in numerical sequence, said counter being reversible to count numerically up or down for accessing said memory addresses in forward or reverse numerical sequence, means for stepping said counter, means effective at the conclusion of one or more forward scans of said memory addresses to reverse the direction of said counter so as to initiate one or more rearward scans of said memory addresses, and means responsive to said memory to produce a waveform the amplitude of which at each sample point is a function of the respective amplitude instruction stored at the memory address corresponding thereto; the improvement wherein:

said memory is characterized by a selected boundary address, the waveform characteristics dictated by the amplitude instructions stored at memory addresses located numerically before said boundary address differing from the waveform characteristics dictated by the ampltiude instructions stored at memory addresses located numerically after said boundary address;

and said instrument comprises means for effecting an initial forward scan between a first memory address numerically smaller than said boundary address and a last memory address numerically larger than said boundary address and further comprising means effective to terminate each of said forward and each of said rearward scans subsequent of said initial scan at one or more memory addresses each located at or numerically after said boundary address with at least some of said one or more memory addresses being different from said first and last memory addresses of said initial forward scan and from said boundary address;

whereby the waveform characteristics dictated by amplitude instructions stored at memory located numerically before said boundary address are not repetitively accessed.

4,442,746

ELECTRONIC ORGAN HAVING AN IMPROVED TONE GENERATOR SYSTEM

Carlton J. Simmons, Jr., Florence, Ky., and Dale M. Uetrecht, Cincinnati, Ohio, assignors to Baldwin Piano & Organ Company, Cincinnati, Ohio

Filed Jun. 26, 1980, Ser. No. 163,409
Int. Cl.³ G10H *1/00*
U.S. Cl. 84—1.01 **12 Claims**

1. An improved electronic musical instrument having a keyboard, function controls, voice controls, and an audio output system comprising:

a plurality of switches associated with the keys of the keyboard, the function controls and the voice controls;

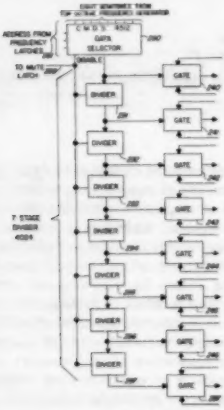
address means for generating multiple bit binary data identifying which of the switches are closed;

control means for processing the data generated by the

address means and determining from the data the notes to be sounded;

a top octave generator for producing top octave generator signals; and

a plurality of programmable generators each capable of generating any one of a plurality of pitch frequencies of different chromatic nomenclatures numbering fewer than twelve and being progammable by the control means for



converting a top octave generator signal specified by said control means to at least one octave specified by said control means in accordance with the data generated by the address means,

each programmable generator being capable, in conjunction with said control means, of passing signals for the same chromatic note in more than one octave to the audio output system simultaneously.

4,442,747

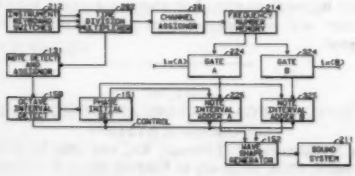
OCTAVE PHASE DECOUPLING IN AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, and Leslie J. Deutsch, Sepulveda, both of Calif., assignors to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed May 11, 1982, Ser. No. 377,118

Int. Cl.³ G10H *1/00*

U.S. Cl. 84—1.01 **10 Claims**



1. In combination with a keyboard operated musical instrument having a keyboard containing a plurality of keyswitches and having a plurality of tone generators each operated at a musical frequency determined by a frequency number selected in response to an actuated keyswitch and wherein each one of said plurality of tone generators generates a musical waveshape, apparatus for initializing the starting phase of a generated musical waveshape comprising;

a frequency number memory means storing a table of frequency numbers,

a detection means for scanning said plurality of keyswitches in a sequence of keyswitch scans wherein a detection signal is generated for each actuated keyswitch,

a frequency addressing means for accessing a frequency number from said frequency memory means in response to said detection signal,

a plurality of tone generators each of which generates a musical waveshape and wherein each one of said plurality of tone generators comprises:

a waveshape memory containing a set of data values corresponding to points comprising said musical waveshape,

a waveshape addressing means responsive to a frequency number accessed from said frequency number means whereby data values from said set of data values are read out of said waveshape memory, and

a signal conversion means whereby said data values read out of said waveshape memory are converted to generate said musical waveform,

an assignor means responsive to said detection signal whereby a frequency number accessed from said frequency number memory means is assigned to one of said plurality of tone generators,

a note interval detection means responsive to said detection signal whereby a control signal is generated if the frequency number accessed from said frequency number memory means differs by a preselected ratio from a frequency number assigned to any other one of said plurality of tone generators, and

a phase initializing means responsive to said control signal and interposed between said frequency number memory means and said assignor means whereby if said control signal is generated the waveshape produced by the tone generator assigned the corresponding said frequency number is phase initialized by causing said associated waveshape addressing means to start addressing data values at a memory address equal to the current memory address of the waveshape addressing means corresponding to one of said plurality of tone generators having an assigned frequency number differing by said preselected ratio thereby causing said tone generator assigned said corresponding said frequency number to generate a musical waveshape having a starting waveshape phase corresponding to the current waveshape phase of a musical waveshape generated by one of said plurality of tone generators having an assigned frequency number differing by said preselected ratio.

9. In combination with a keyboard operated musical instrument having a keyboard containing a plurality of keyswitches in which a series of data values corresponding to the sample points of a composite musical waveform corresponding to a number of actuated keyswitches are generated at equal real time intervals by a discrete Fourier transform computation, apparatus for initializing the starting phase component of the composite musical waveform corresponding to a newly actuated keyswitch comprising;

a frequency number memory means storing a table of frequency numbers,

a detection means for scanning said plurality of keyswitches in a sequence of keyswitch scans wherein a detection signal is generated for each actuated keyswitch,

a frequency addressing means for accessing a frequency number from said frequency memory means in response to said detection signal,

a tone generator comprising a plurality of component waveshape generators each of which creates a component musical waveshape using said Fourier transform computation having a fundamental frequency component corresponding to a frequency number accessed from said frequency memory means,

an assignor means responsive to said detection signal whereby a frequency number accessed from said frequency number memory means is assigned to one of said plurality of component waveshape genertors,

a note interval detection means responsive to said detection signal whereby a control signal is generated if the fre-

quency number accessed from said frequency number means differs by a preselected ratio from a frequency number assigned to any other one of said plurality of component waveshape generators,

a phase initializer means responsive to said control signal and interposed between said frequency number memory means and said assignor means whereby if said control signal is generated the waveshape produced by the component waveshape generator assigned the corresponding said frequency number is phase initialized causing it to generate a first component musical waveshape having a starting phase corresponding to the current waveshape phase of a component musical waveshape generated by one of said plurality of a second component waveshape generator having an assigned frequency number differing by said preselected ratio, and

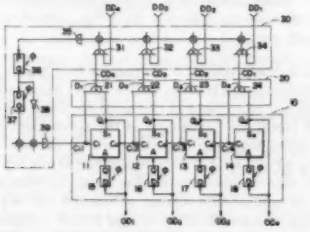
a signal conversion means wherein each of said component musical waveshapes generated by said tone generator are combined to create said composite musical waveshape.

4,442,748

FREQUENCY DIVIDER FOR ELECTRONIC MUSICAL INSTRUMENT

Makoto Kaneko, Hamakita, and Takatoshi Okumura, Hamamatsu, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 22, 1982, Ser. No. 390,830
Claims priority, application Japan, Jun. 23, 1981, 56-96943
Int. Cl.³ G10H 1/00
U.S. Cl. 84—1.01 **13 Claims**



1. A frequency divider for use in an electronic musical instrument comprising:

counter means driven by a predetermined clock pulse for producing a plural-bit count output, said count output having a certain number of different possible values;

cycle data forming means for forming, for each value of count output from said counter means, a certain plural-bit cycle data value in which only a specific single bit is in a first binary state and the rest of the bits are in a second binary state, whereby a certain cycle data value is formed for selected ones of said certain number of different count output possible values, the ratio of the number of cycle data values having a particular specific single bit in a first binary state to the total number of possible different count output values being proportional to the binary significance of said particular certain single bit; and

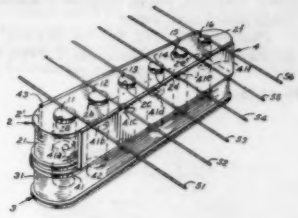
inhibit means for comparing a plural-bit dividing ratio data representative of a dividing ratio with said cycle data for every corresponding bit and for inhibiting counting operation of said counter means when corresponding bits of said dividing ratio data and said cycle data are first states, whereby dividing data is obtained from the output from said counter means.

4,442,749

ELECTRICAL PICKUP FOR A STRINGED INSTRUMENT HAVING FERROMAGNETIC STRINGS

Lawrence P. DiMarzio, Staten Island, and Steven L. Blucher, New York, both of N.Y., assignors to DiMarzio Musical Instrument Pickups, Inc., Staten Island, N.Y.

Filed Aug. 6, 1982, Ser. No. 405,892
Int. Cl.³ G10H 3/18
U.S. Cl. 84—1.15 **4 Claims**



1. An electrical pickup device for a stringed musical instrument having ferromagnetic strings, the device comprising:

a. a pair of superposed coaxial bobbins, each axially wound with a coil having its axis perpendicular to the instrument strings;

b. an integral plate of magnetic material comprising a base disposed between the two bobbins perpendicular to the coil axis and two side walls extending upwardly and perpendicularly from the base to at least immediately below the top face of the upper bobbin; and

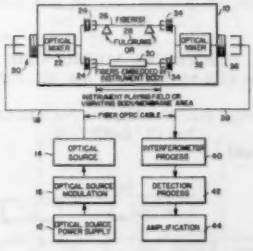
c. a plurality of rod-like permanent magnets extending through at least the upper coil parallel to the axis thereof and in contact with the base of the integral plate and wherein the magnets have like polarities at the tops thereof.

4,442,750

FIBER OPTIC MUSICAL INSTRUMENTS

George A. Bowley, McLean, Va., assignor to Optical Technologies, Inc., McLean, Va.

Continuation of Ser. No. 234,158, Feb. 13, 1981, abandoned.
This application Apr. 14, 1983, Ser. No. 483,445
Int. Cl.³ G10H 3/06
U.S. Cl. 84—1.18 **11 Claims**



1. A musical instrument comprising a musical instrument housing, at least one optical fiber, means embedding or affixing said at least one optical fiber to said musical instrument housing unique to the particular musical instrument housing, means remote from the musical instrument housing for directing a light beam from one end of said fiber to the other, light detecting means remote from the musical instrument housing at the other end of said fiber, whereby when said at least one optical fiber is caused to vibrate the light beam in said fiber is modi-

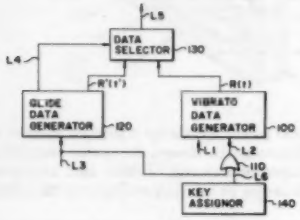
fied, said detecting means including means for producing an electrical signal proportional to the modified light beam, and means for amplifying the electrical signal, including means for intensity modulating the light traveling in said at least one optical fiber.

4,442,751

EFFECT GENERATING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Sadaaki Ezawa, Shizuoka, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Jun. 28, 1982, Ser. No. 392,899
Claims priority, application Japan, Jul. 2, 1981, 56-103684
Int. Cl.³ G10H *1/04*
U.S. Cl. 84—1.25 **1 Claim**



1. In combination an effect generating system for producing a glide effect and vibrato effect and an electronic musical instrument having a keyboard, said effect generating system comprising:

a glide data generator for generating glide data with glide switch information indicating that a glide effect is being restored to an original pitch;

a vibrato data generator for generating vibrato data which comprise a delay vibrato effect in response to a key depression signal;

a data selector for selecting glide data from the glide data generator during performance of a glide effect and for selecting vibrato data from the vibrato data generator during performance of a vibrato effect except during performance of the glide effect; and

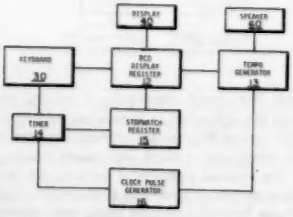
means for starting the delay vibrato effect upon the occurrence of either of said glide switch information during the performance of a glide effect or the occurence of a key depression signal when a glide effect is not being performed.

4,442,752

ELECTRONIC METRONOME

Paul Tsuchiya, 2226 Mohegan Dr., Apt. 301, Falls Church, Va. 22043

Filed Jan. 20, 1982, Ser. No. 315,420
Int. Cl.³ G04F *5/02*
U.S. Cl. 84—484 **9 Claims**



1. A programmable metronome, comprising:

a display register;

keyboard entry means for placing a binary coded digital value in said display register;

a timer adapted to be started and stopped by said keyboard;

a stop watch register incremented in a binary coded digital manner by said timer;

means for transferring the contents of said stop watch register into said display register; and

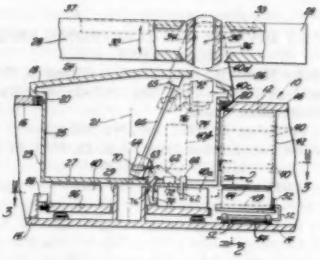
tempo generator means responsive to the contents of said display register for producing a repetitive cadence having a repetition rate in beats-per-minute approximating the digital value of the contents of said display register.

4,442,753

CAROUSEL AUTOMATIC AMMUNITION LOADER SYSTEM

Theodore H. Pouri, and Howard C. Mottin, both of Macomb, Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 22, 1982, Ser. No. 421,602
Int. Cl.³ F41F *9/04*
U.S. Cl. 89—46 **2 Claims**

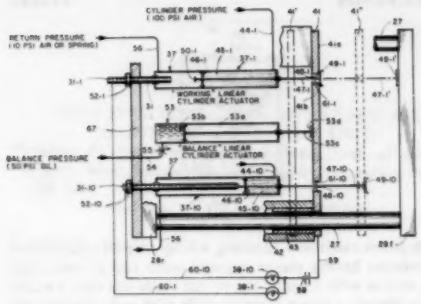


1. In a military vehicle comprising a hull having a longitudinal centerline and a bottom wall, a turret mounted on the hull for rotational movement in the azimuth plane, a gun mounted atop the turret for movement in the elevational plane, and a basket depending from the turret within the hull, said basket including a floor spaced a short distance above the hull bottom wall: the improvement comprising means for storing a multiple number of ammunition rounds within the hull is proximity to the basket; said ammunition storing means comprising a number of spaced vertical walls (**42**) extending parallel to the hull longitudinal centerline to define a series of vertical chutes, the width of each chute measured transverse to the hull longitudinal centerline corresponding to the diameter of an ammunition round whereby the various chutes are enabled to store ammunition rounds one above another in prone positions parallel to the hull longitudinal centerline; conveyor means (**46**) running beneath the vertical chutes along the hull bottom wall and transverse to the hull longitudinal centerline; a stationary round support means (**49**) located in the movement plane of the conveyor means for receiving an individual round of ammunition discharged from said conveyor means; a table (**56**) located beneath the basket floor in close proximity to the hull bottom wall, said table and said round support means occupying a common horizontal plane; power means (**58**) for rotating said table around a vertical axis (**21**) coincident with the turret rotational axis; power means (at **52,54**) for shifting an individual round of ammunition horizontally from the stationary round support means onto the upper surface of said table when the table is stationary; the table and turret being independently rotatable whereby the table can be moved to different rotated positions wherein different areas of the table are aligned with the stationary round support means; and means carried by the basket for transferring individual rounds of ammunition from the table into the space circumscribed by the basket, and thence into the aforementioned gun.

4,442,754
ROBOTICS POSITIONING SYSTEM

Vladimir K. Jezbera, 642 Encino Vista Dr., Thousand Oaks, Calif. 91630

Filed Oct. 14, 1980, Ser. No. 196,666
Int. Cl.³ F01B 25/26
U.S. Cl. 91—1 10 Claims



1. A positioning apparatus comprising:

a frame,

a sliding assembly mounted to said frame for movement relative thereto, said sliding assembly including a slide plate,

at least one "balance" linear cylinder actuator stationarily mounted to said frame and having a ram contactable with said slide plate, and first means for providing a first fluid to the cylinder of said "balance" actuator to bias said ram and hence said slide plate in a first direction,

at least one "working" linear cylinder actuator stationarily mounted to said frame and having a piston fixedly attached to a rod, said rod independently movably extending through said slide plate,

a stop flange fixedly attached to said "working" actuator rod for engagement with said slide plate, said stop flange being on the side of said slide plate opposite from said "working" actuator cylinder, said "working" actuator piston, rod and attached stop flange being unitarily movable independently of said slide plate, and second means for selectively providing a second fluid to the cylinder of said "working" actuator to force the piston and rod thereof in a second direction opposite to said first direction, said stop flange then urging said slide plate in said second direction,

an adjustable stop member, mounted to said frame and positioned to limit the travel of said "working" actuator rod in said second direction, so that when said second means provides fluid to said "working" actuator cylinder the piston and rod thereof can move said slide plate and sliding assembly in said second direction, overcoming the force of said "balance" actuator, until said rod is stopped against said adjustable stop member, said "balance" actuator and ram damping and correcting overshoot of said slide plate so that said sliding assembly is accurately positioned at a location set by the adjustment of said stop member.

4,442,755
POWER STAGE SERVO VALVE FOR A SEISMIC VIBRATOR

Marek L. Rozycki, Houston, Tex., assignor to Litton Resources Systems, Inc., Alvin, Tex.

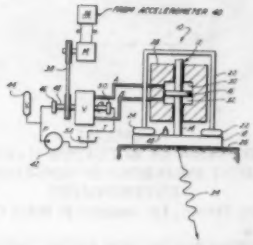
Filed Jan. 25, 1982, Ser. No. 342,274
Int. Cl.³ F15B 21/02
U.S. Cl. 91—39 3 Claims

3. A rotary hydraulic power control servo valve comprising:

a valve body having pressurized-fluid inlet port and outlet ports and two peripheral ports

a stator mounted interiorly of said valve body, said stator including a stationary orifice plate, defining at least two diametrically opposite stationary orifices having desired geometric boundaries including full width radial lateral boundaries, the inner and outer boundaries being concentric circular arcs;

a rotary orifice plate that abuts said stationary orifice plate, said rotary orifice plate defining at least two diametrically opposite rotary orifices, the orifices having desired geometric boundaries including at least one full width radial lateral boundary at the leading edge of the orifice, the trailing boundaries being arcs of curves having different foci;



a shaft for supporting and rotating said rotary orifice plate relative to said stationary orifice plate, first and second non-communicating fluid passageways extending inwardly from each end of said shaft that fluidly communicate respectively with said inlet and outlet ports;

means for providing fluid communication between each said stationary orifice and a corresponding one of said peripheral orifices;

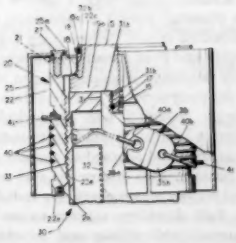
means for providing fluid communication between each said rotary orifices and a corresponding one of said noncommunicating passageways; and

means for rotating said rotary orifice plate in one direction relative to said stator.

4,442,756
HEAT SENSITIVE LOCKING DEVICE

Kip B. Goans, Harvey, La., assignor to Baker, CAC, Inc., Belle Chase, La.

Filed Aug. 24, 1981, Ser. No. 295,202
Int. Cl.³ F15B 15/26
U.S. Cl. 92—23 9 Claims



1. A heat sensitive, fluid pressure actuator, comprising: a housing defining a cylinder chamber; a piston reciprocatingly mounted in said cylinder chamber for movement between two extreme axial positions; resilient means urging said piston to one of said extreme axial positions; said piston having a shaft portion with its end exposed relative to said housing when said

piston is in the other of said extreme axial positions; said housing having an external, annular, radially inclined shoulder surrounding said piston shaft portion, and fusible means for securing said piston shaft to said radially inclined shoulder comprising a stop block abutting said exposed piston shaft end; a latch having one end engaging and axially restraining said stop block, said latch having a complementary inclined surface abutting said radially inclined shoulder on said housing, whereby said latch is biased outwardly to a disengaging position by the force of said resilient means; a spring wire element forcibly wrapped around said latch and said housing to retain said latch in latching engagement with said radially inclined shoulder; and a fusible link holding said spring wire element in said wrapped position.

4,442,757

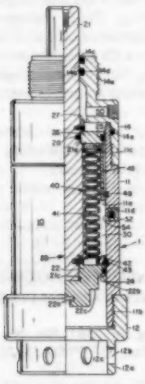
FLUID PRESSURE ACTUATOR HAVING BIAS ELEMENT IMMERSED IN NON-CORROSIVE ENVIRONMENT

Kip B. Goans, Harvey, La., assignor to Baker CAC, Inc., Belle Chasse, La.

Filed Aug. 24, 1981, Ser. No. 295,449

Int. Cl.³ F01B *31/18*

U.S. Cl. 92—82 **8 Claims**



1. A fluid actuator, comprising: a hollow body defining a fluid pressure chamber having a cylindrical internal wall; a piston shaft mounted in said hollow body for axially slidable movement within said fluid pressure chamber; a pair of axially spaced, radially projecting shoulders on said piston shaft; sealing means on the peripheries of said shoulders for respectively slidably sealingly engaging said cylindrical internal wall, thereby defining an annular chamber surrounding and movable with said piston shaft and adapted to contain a corrosion protection fluid; biasing means disposed in said annular chamber, one end of said biasing means abutting a radial surface on one of said piston shaft shoulders; support means secured to said cylindrical internal wall within said annular chamber and engaging the other end of said biasing means; a radial piston face on said piston shaft exteriorly of said annular chamber; and fluid conduit means in said body for applying fluid pressure to said piston face to move said piston shaft axially relative to said hollow body in a direction to energize said biasing means without changing the volume of said annular chamber.

4,442,758

PISTON MACHINE

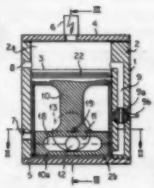
Robert C. Groll, Cosimastrasse 227, D-8000 München 81, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,183

Claims priority, application Fed. Rep. of Germany, Oct. 20, 1980, 3039536

Int. Cl.³ F01B *9/00*; F16J *1/10*

U.S. Cl. 92—138 **4 Claims**



1. A piston machine comprising a body formed with at least one cylinder having planar opposite walls and an elongated cross section with a width across said walls less than a width parallel thereto, a piston reciprocatable with said cylinder, said piston being flat and having substantially planar opposite sides, said piston having massive portions spaced apart in a direction of movement of said piston and rounded edges extending in said direction, and a crankshaft journaled in said body and having at least one crankpin, said piston being formed directly with a throughgoing transverse slot in one of said massive portions receiving said pin perpendicular to said sides, whereby said crankshaft is coupled to said piston, said pin having a length equal to said width across said walls.

4,442,759

POWER BOOSTER UNIT

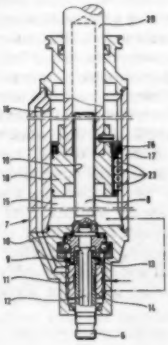
Dieter Elser, Essingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,272

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027212

Int. Cl.³ F16J *1/02*

U.S. Cl. 92—165 PR **4 Claims**



1. In a power steering unit having a cylinder and a piston therein, and means for overcoming torque force on said piston; the improvement of said means comprising respective longitudinal opposed grooves in said cylinder and said piston wherein the groove in said cylinder extends at least the length of traverse of said piston therein;

said grooves effecting a pocket; guide means in said pocket carried slidably by said piston within said grooves so as to

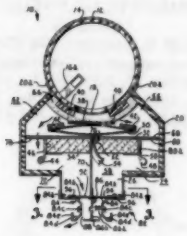
prevent relative rotation between said cylinder and piston by sliding in the groove of said cylinder during reciprocation of said piston; wherein said guide means comprises at least one roller having axes parallel to the cylinder axis and bias means for biasing said roller against the groove of said cylinder.

4,442,760

FLOW SPLITTING ARRANGEMENT FOR AIR CONDITIONING TERMINAL UNITS

Raymond H. Dean, and Ghassan Bader, both of Johnson County, Kans., assignors to Tempmaster Corporation, Kansas City, Mo.

Filed Sep. 30, 1982, Ser. No. 431,364
Int. Cl.³ F24F *13/08*
U.S. Cl. 98—40 D **6 Claims**



1. A terminal unit for an air distribution system, said terminal unit comprising:

a duct for receiving a supply of conditioned air, said duct having first and second outlets spaced apart from one another along the length of the duct for discharging conditioned air therefrom;

flow control means for controlling the flow through said first and second outlets;

a plenum connected with said duct, said plenum presenting an upper plenum chamber communicating with said outlets to receive conditioned air therefrom and a lower plenum chamber below the upper chamber;

a transverse partition in said upper plenum chamber between said first and second outlets, said transverse partition dividing said upper plenum chamber into first and second compartments communicating with the respective first and second outlets, said compartments being arranged generally end to end and each extending substantially the entire width of the upper plenum chamber;

a longitudinal partition in said lower plenum chamber dividing same into third and fourth compartments arranged generally side by side and each extending substantially the entire length of the lower plenum chamber;

baffle means between the upper and lower plenum chambers for directing the conditioned air in said first compartment into said third compartment and the conditioned air in said second compartment into said fourth compartment; and

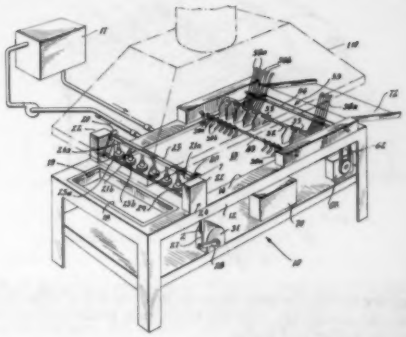
an air diffuser having a first diffuser slot communicating with said third compartment to discharge the conditioned air therefrom and a second diffuser slot communicating with said fourth compartment to discharge the conditioned air therefrom, said diffuser slots extending generally side by side substantially the entire length of the plenum and arranged to direct the air passing therethrough to opposite sides of the air diffuser.

4,442,761

APPARATUS FOR MAKING PASTRY PRODUCTS

Johan Van Achterberg, Easton, and George N. Miles, Norwalk, both of Conn., assignors to Elsie Palmieri, Danbury, Conn.

Filed Sep. 23, 1980, Ser. No. 190,026
The portion of the term of this patent subsequent to Jul. 17, 2000, has been disclaimed.
Int. Cl.³ A47J *37/12*
U.S. Cl. 99—404 **12 Claims**



1. In apparatus for making pastry products comprising batter holding means,

tank means for holding heated cooking liquid,

forming means including at least one forming iron for forming pastry products by dipping in batter contained in said batter holding means and in heated cooking liquid in said tank means, and dipping means for so dipping said iron sequentially according to an established time sequence,

conveyor means for conveying pastry products after removal from said iron, from the region in said tank means where said forming means dips into such cooking liquid to the region thereof where pastry are removed from such liquid,

extractor means for causing such pastry products to be removed from such liquid, and

inverter means for inverting such products after they have been conveyed part way toward, but before they have reached, said extractor means,

said iron being adapted for maintaining its temperature within prescribed limits, and said apparatus including means for causing said iron to be substantially entirely free from such cooking liquid upon being dipped in such batter after having been removed from such cooking liquid.

4,442,762

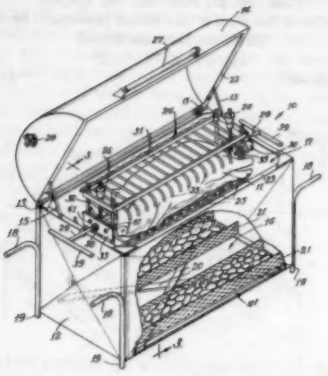
MEAT ROASTER

Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc., North Aurora, Ill.

Filed Mar. 11, 1982, Ser. No. 357,330
Int. Cl.³ A47J *37/07*
U.S. Cl. 99—427 **13 Claims**

1. In a food roasted comprising a firebox generally rectangular in plan having vertically standing end walls and sidewalls and an open top and an open bottom, means for supporting said firebox above the ground, a charcoal basket disposed and supported in the lower portion of said firebox, a lid hinged to the upper edge of one of said sidewalls and a spit for supporting food to be cooked in the upper portion of said roaster, said spit being supported by said end walls of said firebox, the improvement wherein said spit comprises a basket formed by two confronting sets of generally bow-shaped grate fingers, said basket having a long axis of rotation, a frame having two members, each of said two sets having a plurality of fingers, said fingers being secured to a frame member, and means for supporting said frame, said frame members each being secured at basket-outward surfaces of one set of grate-fingers whereby

the fingers alone provide food-gripping contact, said frame-supporting means being located at opposite basket ends and arranged generally transverse to said long axis and being ad-



justable to vary the space between said two sets of grate fingers and frame members, whereby to grip and retain the food to be roasted within said basket.

4,442,763

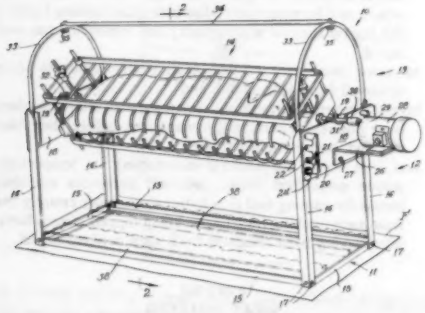
MEAT ROASTER

Frank W. Beller, Aurora, Ill., assignor to Belson Manufacturing Co., Inc., North Aurora, Ill.

Filed Jan. 10, 1983, Ser. No. 456,830

Int. Cl.³ A47J *43/18*

U.S. Cl. 99—427 **7 Claims**



1. A framework for a meat roaster, generally rectangular in plan and capable of rotationally supporting spit basket means, being adapted for enclosure by sheet-like metal and capable of accommodating a heating source below the spit basket means, the framework provides means for mounting a rotisserie motor in driving relationship with a spit basket means, said framework comprising:

lower frame means providing a framework support base and being generally rectangular in plan;

intermediate frame means associating with and supported by said lower frame means, including vertical cornerpost members disengageably fastened to said lower frame means at corners of the rectangle, opposing end plate members supported generally above opposite shorter sides of the rectangular lower frame means and means for releasably fastening said end plate members to said cornerpost members, said end plate members having longitudinally aligned bearing support means capable of supporting a spit basket means lengthwise in the framework and having means for supporting a rotisserie motor in driving relationship with a spit basket means, and said cornerpost members further including disengageable support means adjacent upper ends thereof;

upper frame means including opposite hoop-like members spanning across said intermediate frame means and removably supported at said disengageable support means of the cornerpost, members a longitudinal support member extending lengthwise of said framework and having opposite ends disengageably fastened to said hoop-like members;

whereby said intermediate frame means is adapted to be enclosed by sheet-like metal to form a four-wall firebox chamber, wherein charcoal baskets may be supported lengthwise by said lower frame means below and to the sides of a spit basket means, wherein said upper frame means is adpated to be enclosed by sheet-like metal forming a dome-shaped ceiling over said firebox chamber, and thereby said framework is capable of being completely enclosed forming a free standing, portable meat roaster, capable of disassembly.

4,442,764

MACHINE FOR PEELING AND CLEANING FOODSTUFFS, PARTICULARLY VEGETABLES SUCH AS ONIONS

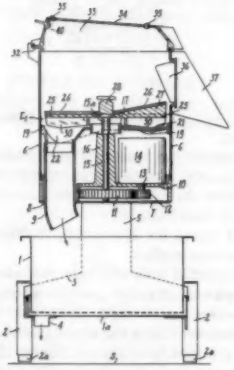
Pierre H. Bos; Joël R. Musseau, and Claude Rochez, all of Aubusson, France, assignors to Dito-Sama, Aubusson, France

Filed Sep. 20, 1982, Ser. No. 419,813

Claims priority, application France, Sep. 23, 1981, 81 17924

Int. Cl.³ A23N *7/00, 7/02;* A47J *17/00, 17/18*

U.S. Cl. 99—633 **10 Claims**



1. A machine for peeling and cleaning food products, particularly vegetables such as onions, said machine comprising a container supported by adjustable legs so a to enable vertical adjustment of said container, a filter in said container opening into a discharge duct, said filter having an upper portion support a cylinder having a base plate, a motor and reduction gear assembly mounted on said base plate and driving a central vertical shaft, a shaped plate covering said assembly and having a radial opening connected to a nozzle opening above said filter, a disc provided with at least one boss driven by said shaft, said disc having an upper surface coated with an abrasive layer, said cylinder having an open top closed by a releasable water tight cover through which the products to be cleaned are introduced, a discharge chute projecting laterally from said cylinder through which said products are discharged after having been cleaned, a door normally obturating said discharge chute, and means for introducing a washing liquid into said cylinder, wherein said disc has a diameter slightly smaller than the inner diameter of said cylinder such as to form an annular space therebetween, the shaped plate in said cylinder

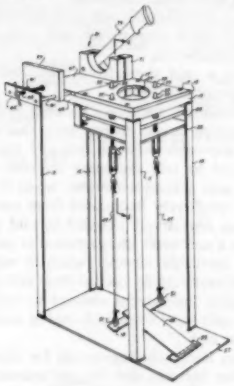
has a top shaped so as to cooperate with said rotating disc, said disc having a bottom comprising fins promoting disengagement of scraps and said washing liquid from said products by causing a pumping effect projecting a mixture of said washing liquid and scraps toward said discharge nozzle through said annular space.

4,442,765

DEVICE FOR PREPARING A BUNCH OF PRODUCE FOR SHIPMENT, DISPLAY AND SALE

William L. Limehouse, 1468 S. Edgewater Dr., Charleston, S.C. 29407, and Thomas A. Miller, P.O. Box 602, Hastings, Fla. 32045

Filed Apr. 5, 1982, Ser. No. 365,151
Int. Cl.³ B65B 13/02
U.S. Cl. 100—6 6 Claims



1. A device for placing a rubber band around the stalk portions of a bunch of produce having uneven stalk lengths and relatively evenly positioned head comprising:

a vertically extending frame member;

an upper plate member carried on said vertically extending frame member and being fixed thereto;

a lower plate member carried by said frame member vertically spaced below said upper plate member, said lower plate member being fixed to said frame member;

a vertically movable intermediate plate member carried between said upper and lower plate members;

centrally located stalk receiving holes provided in said plate members of sufficient diameter for a stalk portion of said bunch of produce to be inserted therethrough;

a plurality of holes located in said upper plate member concentrically about said stalk receiving hole;

a plurality of pins carried by said intermediate plate member, each extending vertically through a respective hole of said plurality of holes provided in said upper plate member;

resilient means forcing said intermediate plate member to a raised position wherein said plurality of pins project above said upper plate member for receiving a stretched rubber band therearound, and

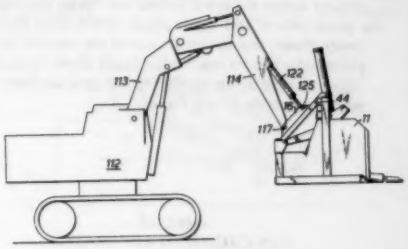
means for depressing said intermediate plate member retracting said pins below said upper plate member for releasing said rubber band about the stalk portion of said bunch of produce that is inserted through said centrally located stalk receiving hole.

4,442,766

MOBILE CRUSHER VEHICLE

Peter A. T. Hawkins, White Cross Farm, Cholsey, Oxfordshire, England

Filed Dec. 1, 1981, Ser. No. 326,421
Claims priority, application United Kingdom, Dec. 5, 1980, 8039004; Jun. 26, 1981, 8119865
Int. Cl.³ B30B 9/32
U.S. Cl. 100—35 22 Claims



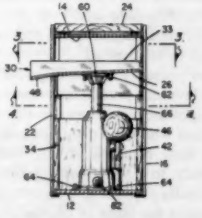
19. A method of crushing an object, comprising providing a vehicle having a crusher jaw mechanism mounted in a forward position thereon, the crusher jaws mechanism comprising a platform affixed thereto, a press plate and closure means for urging the plate and the platform towards one another, the platform having a leading edge provided with guide means for the object, advancing the vehicle forwardly towards the object to drive the guide means and the platform under the object to load the object onto the platform, and crushing the object between the press plate and the platform.

4,442,767

JUICE PRESS

Rick A. Johnson, 1926 Lindsley Park Dr., San Marcos, Calif. 92069

Filed Jun. 28, 1982, Ser. No. 392,739
Int. Cl.³ B30B 9/06
U.S. Cl. 100—116 6 Claims



1. A juice squeezer comprising in combination:

an upper platen;

a base member;

a frame interconnecting the base member and upper platen such that they have fixed spacing and are in juxtaposition;

a lower platen disposed between said upper platen and said base in juxtaposition with each of them;

track means carried by said frame for guiding movement of said lower platen in a direction toward and away from said upper platen while the lower plate remains in juxtaposition with each of them;

pressing means for forcing the lower platen to move toward the upper platen along said track means and for releasing the lower platen from said force to permit retraction of the lower platen from said upper platen;

said pressing means comprising a jack interposed between said lower platen and said base;

said frame being formed by a plurality of elongated frame members each fixed at respectively associated ends to said base and said upper platen, said members being spaced around the periphery of said base and said upper platen, and in which said track means is formed by said frame members;

said lower platen comprising a plate which extends transversely across the space within said frame members; and

the lower side of said upper platen which faces toward the lower platen, and the upper side of the plate of the lower platen which faces toward the upper platen lying at fixed angles relative to one another in non-parallel planes which intersect outside of said frame.

4,442,768

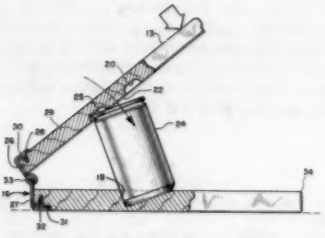
CAN CRUSHING APPARATUS

John R. Bailey, 3735 Geraghty Ave., Waukegan, Ill. 60085

Filed Feb. 1, 1982, Ser. No. 344,514

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—233 **14 Claims**



1. A can crusher comprising:

a base having a pivot portion and a recess for receiving at least a portion of one end of a can to be crushed;

a crusher lever having a pivot portion, a handle portion, and a recess intermediate said lever pivot portion and handle portion for receiving at least a portion of the opposite end of the can to be crushed;

pivot means pivotally connecting said pivot portions of the base and lever for pivotal movement of the lever by forceful urging of the handle portion thereof from a can receiving position wherein a can to be crushed may be disposed with its ends received in said base and lever recesses respectively, to a partial crush position wherein the can is longitudinally crushed to a preselected longitudinal thickness wherein the plane of the top of the can is disposed at a partial crush angle to the plane of the bottom of the can; and

planar surface means on said base and lever respectively intermediate said recesses and said pivot means for receiving the partially crushed can therebetween with said top plane of the partially crushed can directed downwardly toward said pivot means, the angle of said surface means of said lever extending at an angle toward said pivot means to said surface means of the base which is less than said partial crush angle when the lever is pivoted to engage the top of the partially crushed can so disposed between said surface means for completion of the crushing of the entire can to a final desired crushed thickness as a result of further pivotal movement of the lever toward the base.

4,442,769

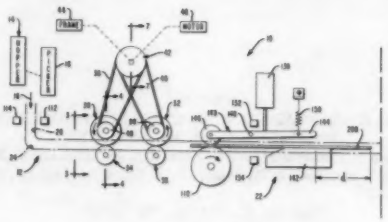
STAGING APPARATUS USED IN A SHEET FEEDING ENVIRONMENT

Fredrik L. N. Kallin, Kitchener, Canada, assignor to NCR Corporation, Dayton, Ohio

Filed Dec. 24, 1981, Ser. No. 334,399

Int. Cl.³ G06K *13/077*

U.S. Cl. 101—93.19 **4 Claims**



1. A sheet feeding apparatus comprising:

means for guiding a sheet therein; said guiding means having an upstream end and a downstream end, with a staging area located therebetween;

means for moving a said sheet from said upstream end towards said downstream end;

control means including a stationary member and a moveable member located at said staging area; said moveable member being moveable between first and second positions with regard to said stationary member and said moving means; said moveable member when in said first position being operatively uncoupled from said moving means and being operatively coupled to said stationary member to stop a said sheet therebetween at said staging area, and said moveable member when in said second position being operatively uncoupled from said stationary member and being operatively coupled to said moving means to move said sheet from said staging area towards said downstream end;

said control means also including means for moving said moveable member between said first and second position;

a utilization device located downstream from said staging area to receive a said sheet from said staging area; and

said control means also including means for determining the length of a said sheet which becomes positioned at said utilization device; said control means also responding to said determining means so as to enable said moving means to stop a subsequent sheet at said staging area so that the leading edge of said subsequent sheet is positioned at a predetermined distance from the trailing edge of said sheet at said utilization device.

4,442,770

PUSHROD FOR HIGH SPEED

Hilliard Dozier, Morrow, Ohio, assignor to U.S. Terminals, Inc., Cincinnati, Ohio

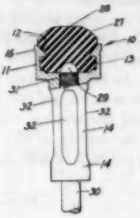
Filed Apr. 21, 1982, Ser. No. 370,362

Int. Cl.³ B41J *9/26*

U.S. Cl. 101—93.32 **12 Claims**

1. A pushrod for an impact printer comprising an elongated pushrod wire, a concentric tip member mounted on at least one end of said wire in axial alignment with the longitudinal axis of said pushrod wire, said tip member comprising an annular body having an outer end surface and an inner end surface, an elongated shank projecting outwardly from the inner end surface of said annular body, an axial bore in said shank for receiving an end of said pushrod wire, a seat-forming recess in the outer end surface of said annular body, said seat-forming recess comprises a conical surface having its largest diameter outermost, an undercut cavity in said body underlying and in communication with said seat-forming recess, and a molded in

situ impact button seated in said recess and having an integral portion thereof filling said cavity, said impact button projecting outwardly from said recess and having an impact surface at its outermost end which is concentric with respect to the axis of said axial bore.



4,442,771

APPARATUS FOR APPLYING A FOAMED TREATING MEDIUM TO A WORKPIECE

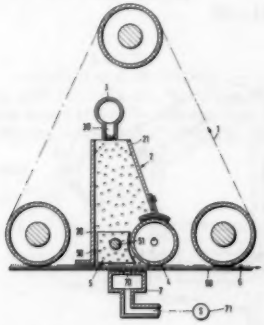
Mathias Mitter, Falkenstrasse 57, D-4815 Schloss Holte, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,822

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1980, 3044409

Int. Cl.³ B41L *13/02*

U.S. Cl. 101—122 **13 Claims**



1. Apparatus for applying a foamed treating medium to the upper side of a foraminous workpiece, comprising a screen disposed above the upper side of the workpiece and having at least one first portion of greater permeability and at least one second portion of lesser permeability; confining means defining a circumferentially enclosed space above said screen and having an open bottom side adjacent to the screen; foam generator means; means for admitting the foamed treating medium from said foam generator means into said space; applicator means for forcing the foamed treating medium from said space through said screen and into contact with the workpiece whereby the rate of penetration of foamed treating medium by way of the first portion of said screen exceeds the rate of penetration by way of the second portion of said screen with attendant accumulation of foamed treating medium above said second portion; means for moving at least some of the accumulated foamed treating medium from above said second portion to above said first portion of the screen; means for displacing said moving means in said space with reference to said confining means at a speed such that the movements of said moving means do not entail mechanical destruction of the foamed treating medium in said space; and suction generating means disposed below the screen and the workpiece and arranged to draw the treating medium through the screen and into the workpiece.

4,442,772

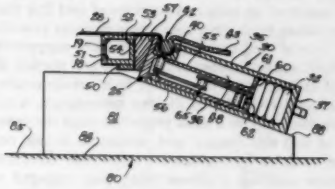
SCREEN TENSIONING APPARATUS

Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Filed Oct. 26, 1982, Ser. No. 436,855

Int. Cl.³ B05C *17/08*

U.S. Cl. 101—127.1 **9 Claims**



1. A screen fabric tensioning apparatus for stretching a fabric outwardly across a frame and for forcing one side screen frame member of the frame vertically against the fabric to facilitate securing of the fabric to the frame, said apparatus comprising:

a frame support means for supporting at least one side screen frame member of the frame,

a fabric carrying means connectable to the fabric and movable relative to the frame support means and the side screen frame member to pull and stretch the fabric outwardly across the frame,

power means to shift the fabric carrying means outwardly relative to the frame support means, and

means for shifting the frame support means and the one screen frame member vertically with stretching of the fabric so that the screen frame member is moved into tight engagement with the fabric as the power means is operated.

4,442,773

PRINTING MODE SHIFTING DEVICE FOR BLANKET CYLINDERS IN OFFSET ROTARY PRESS

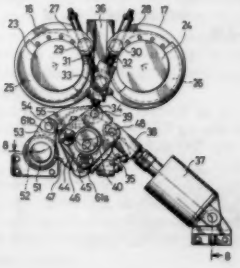
Haruyoshi Kobayashi, Yokohama, Japan, assignor to Kabushiki Kaisha Tokyo Kikai Seisakusho, Tokyo, Japan

Continuation of Ser. No. 193,085, Oct. 2, 1980, abandoned. This application Feb. 4, 1983, Ser. No. 463,672

Claims priority, application Japan, Feb. 6, 1980, 55-13268

Int. Cl.³ B41F *5/06, 7/12, 13/36*

U.S. Cl. 101—177 **4 Claims**



1. A printing mode shifting device for blanket cylinders in a rotary press which has cylinders arranged generally cross-sectionally in the shape of an equilateral triangle and including two plate cylinders disposed at two vertexes of the equilateral triangle, an impression cylinder disposed at the remaining vertex of the equilateral triangle, and blanket cylinders dis-

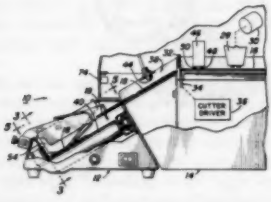
posed between said plate cylinders and said impression cylinder, eccentric sleeves provided at support portions at both ends of said blanket cylinders, and a common link mechanism for displacing said blanket cylinders with respect to each other and with respect to the other cylinders simultaneously and which permits obtaining two ultimate positions, a first of which is a blanket to blanket type printing mode with four series-contacting cylinders exclusive of the impression cylinder, and a second of which is a satellite type printing mode with five series-contacting cylinders including the impression cylinder, said shifting device comprising a cross shaft rotatably supported on right and left side frames, a pair of crank arms fixedly mounted on both end portions of said link mechanism, a reciprocating actuator, a conversion member provided at one side of one of said crank arms, rotatably supported on said cross shaft, and connected at one outer end portion thereof to a rod of said actuator to convert linear reciprocating movements of said rod into oscillatory movements, a relay gear rotatably mounted on a shaft projected from the outer surface of one of said side frames, and connected to said conversion member so as to be oscillated in the same direction as said conversion member, a driven relay gear engaged with said relay gear, rotatably mounted on said cross shaft, and positioned at the other side of said crank arm, a clutch for transmitting from said conversion member to said one of the crank arms to select two opposite rotations, one of which transmits direct rotation when said blanket cylinders are displaced between a first ultimate position and a first intermediate throw-off position and between a second ultimate position and a second intermediate throw-off position, and another of which transmits reverse rotation when said blanket cylinders are displaced between said first intermediate throw-off position and said second intermediate throw-off position, said blanket cylinders being displaceable between said first ultimate position and said second ultimate position through said first and second intermediate throw-off positions, the amount of displacement of said blanket cylinders between the two ultimate positions exceeding the tooth height of the driving gears for said blanket cylinders and the cylinders contacting with said blanket cylinders, and said first intermediate throw-off position being provided close to said first ultimate position and keeping gearing within a gear train in said first ultimate position; and said second intermediate throw-off position being provided close to said second ultimate position and keeping gearing within a gear train in said second ultimate position.

4,442,774

PRINTER WITH AUTOMATIC STACKER

Frederick M. Pou, Dayton, and Richard L. Straub, Miamisburg, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Jun. 30, 1982, Ser. No. 393,674
Int. Cl.³ B41F *13/56*
U.S. Cl. 101—226 **21 Claims**



1. A printer for making imprints onto a web of sheet stock having indices disposed thereon at predetermined intervals, comprising:

means for making imprints on the web;

means for cutting the web into tags;

means for feeding the web past said imprint making means and said cutting means;

means for sensing the indices as the web is fed past the imprint making means; and

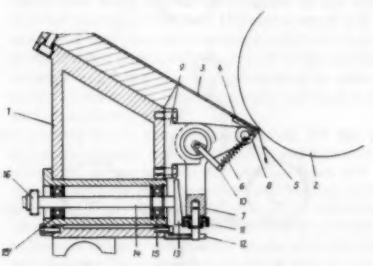
means responsive to the index sensing means for controlling the operation of the feeding means and the cutting means, said control means being operative to cause the feeding means selectively to feed the web such that one of the indices on the web is advanced one of at least two different increments past the sensing means after the sensing thereof prior to the cutting of the web by said cutting means, thereby to produce at least two different lengths of tags.

4,442,775

DEVICE FOR ADJUSTING AN INK KNIFE IN AN INK-APPLICATOR OF A PRINTING MACHINE

Arndt Jentzsch, Coswig; Hans Johne, Radebeul, and Wolfgang Müller, Coswig, all of German Democratic Rep., assignors to Veb Kombinat Polygraph "Werner Lamberz", Leipzig, German Democratic Rep.

Continuation-in-part of Ser. No. 412,859, Aug. 30, 1982. This application Sep. 27, 1982, Ser. No. 424,988
Claims priority, application German Democratic Rep., Aug. 31, 1981, 232885
Int. Cl.³ B41F *31/02*
U.S. Cl. 101—365 **4 Claims**



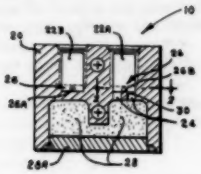
1. A device for adjusting an ink knife of an ink-applicator of a printing machine, comprising a plurality of adjusting means positioned below the ink knife successively one after another lengthwise of a ductor roller of the ink applicator and operated to forcefully move a stripped edge of the ink knife to and from the ductor roller to adjust a plurality of ink zones between said stripped edge and a circumferential surface of the ductor roller, said ink applicator having a housing, said adjusting means each comprising a pivotable lever having a first arm operatively connected to said stripped edge and a second arm; actuating means operatively connected to said second arm and adapted to pivot said lever in said housing so that the motion of the lever is translated into the motion of said ink knife to adjust a respective position thereof; a support element rigidly connected to said housing; and a tension spring interconnected between said stripped edge and said support element and extended substantially perpendicular to said ink knife, said tension spring biasing said lever in its adjusted position; said second arm being provided with a pin outwardly extended therefrom and carrying a self-aligning bearing, said actuating means including a usable spindle provided with a cam having a cam surface, said self-aligning bearing cooperating with said cam surface upon turning movement of said spindle.

4,442,776

DETONATOR BLOCK

Bruce B. Jones, Mt. Aukum, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 21, 1982, Ser. No. 370,232
Int. Cl.³ F42C 19/08
U.S. Cl. 102—275.12 6 Claims



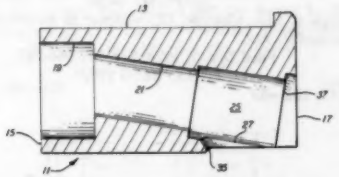
1. A detonator block having a plurality of adjacent separated ports for detonators, with one of said ports having an outlet, means for supporting a different detonating cord adjacent each different port of said plurality of ports, a cavity in communication with said outlet of said port and a bridge portion spanning said outlet of said port.

4,442,777

ADAPTOR CARTRIDGE

Edward Greene, 1497 Palenville Rd., Saugerties, N.Y. 12477

Continuation-in-part of Ser. No. 203,466, Nov. 3, 1980, abandoned. This application Dec. 27, 1982, Ser. No. 453,133
Int. Cl.³ F42B 5/22
U.S. Cl. 102—444 3 Claims



1. A cartridge adaptor for firing a projectile from a center-fired weapon utilizing a rim-fired blank cartridge, said cartridge adaptor comprising:

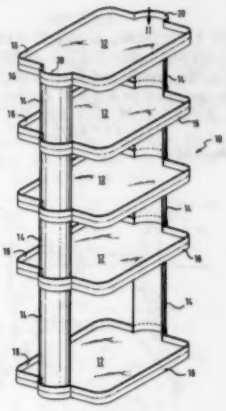
a tubular casing have a mouth end and a head end, said mouth end having a concentrically-located cylindrical opening for locating a projectile, said tubular casing further having a passageway extending from the projectile opening to the head end, said passageway including a cartridge chamber at the head end and being located at an acute angle to said tubular casing for retaining a rim-fired blank cartridge, the circumference of said cylindrical passageway substantially intersecting the center point of the head end and said tubular casing having an open section along the cartridge chamber adjacent to the head end, said open section extending into the cartridge chamber from the head end along the tubular casing more than a major portion and less than the entire length of the cartridge chamber.

4,442,778

MULTIPLE STORY TOWER

Franz J. Lang, Uhlandstrasse 5, D-6233 Kelkheim (Taunus), Fed. Rep. of Germany

Continuation of Ser. No. 234,571, Feb. 13, 1981, abandoned. This application May 16, 1983, Ser. No. 494,136
Claims priority, application Fed. Rep. of Germany, Feb. 2, 1980, 3006377
Int. Cl.³ A47B 47/00
U.S. Cl. 108—111 7 Claims



1. A multiple-story tower for the display of merchandise comprising:

A. a plurality of spaced story decks each encircled by an encircling wall extending around the edge of said story deck and each said story deck having a center spaced equidistantly from the opposite sides thereof,

B. two spacing supports extending between and connecting two adjacent said story decks,

C. each said story deck having a first axis and a second axis extending perpendicularly to one another and intersecting at said center and said story decks arranged symmetrically about each of said axes,

D. each spacing support located at an opposite end of the first axis where the first axis intersects said encircling wall,

E. each said spacing support, forming a groove-like configuration and having an outer surface facing away from said center and an inner surface facing toward said center,

F. said spacing supports between adjacent said spaced story decks having an approximately constant cross-section in a sectional plane parallel with said story decks,

G. said story decks include receiving shafts at the location of the intersection of the first axis with the encircling wall, said receiving shafts arranged to receive and align said spacing supports,

H. each said receiving shaft is formed by at least one outer shaft-limiting wall forming a part of said encircling wall and located at the intersection of the first axis with said encircling wall and at least one inner shaft-limiting wall located closer to the center of said story deck, said outer shaft-limiting wall is shaped complementary to the outer surface of said spacing support and said inner shaft limiting wall is shaped complementary to the inner surface of said spacing support,

I. snap securing means for securing said spacing support to at least one of said inner and outer shaft-limiting walls,

J. said securing means includes a cam and a depression arranged to receive said cam,

K. each said cam has a surface extending obliquely to the surfaces of said spacing support and the respective inner and outer limiting wall,

L. said story decks are closed in the area of said receiving shafts, and

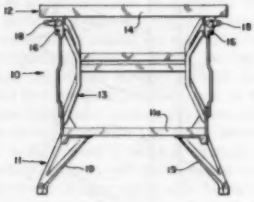
M. the length of said spacing supports in the direction of the second axis is significantly less than the length of the second axis between its intersection with said encircling wall along the edges of said story decks.

4,442,779

UNITARY LATCHING AND RELEASE MEANS FOR PORTABLE FOLDABLE WORKBENCH

Frank Basten, Brockville, and Peter Oxley, Mallorytown, both of Canada, assignors to Black & Decker Inc., Newark, Del.

Filed Dec. 24, 1981, Ser. No. 334,433
Int. Cl.³ A47B *3/00*
U.S. Cl. 108—131 8 Claims



1. In a portable foldable workbench having a raised erected position and a lowered storage position, the workbench including a base, a table having a pair of spaced parallel brackets secured thereto, and an intermediate supporting structure pivotably connected between the brackets and the base and including a pair of transverse pivoted supporting struts, one for each of the brackets, a unitary latching and release mechanism between the table and the supporting structure, and between the supporting structure and the base, respectively, the unitary latching and release mechanism comprising, in combination, a stud connected to one end of each supporting strut, each bracket having a slotted opening formed therein to slidably receive the stud, a raised emboss formed on the bracket near one end of the slotted opening therein, the stud being normally received at the one end of the slotted opening and adjacent to the raised emboss therein in the erected position of the workbench, resilient means constantly urging the stud in its normal position within the slotted opening, a manually-manipulatable button secured to the stud and accessible outwardly of the workbench, whereby the button may be pressed laterally inwardly against the bias of the resilient means to clear the stud from the raised emboss and enable the stud to slide in one direction within the slotted opening, and whereby the supporting strut will be carried conjointly with the stud, thereby enabling the workbench to be folded into its lowered position, the stud being received at the other end of the slotted opening in the lowered position of the workbench, a spring latch secured to the bracket transversely of the slotted opening and overlying the stud in the lowered position of the workbench, the latch having an end portion extending beyond the bracket, and the base having an opening formed therein to receive the end portion of the latch, thereby retaining the workbench in its lowered position, whereby the button may again be pressed laterally inwardly to push the stud against the latch and clear the end portion of the latch from the opening in the base, thereby enabling the workbench to be raised, and whereby the stud slides in the opposite direction within the slotted opening and rides over the raised emboss with a snap-action to retain the workbench in its erected position.

4,442,780

CLIPBOARD AND SHIELD

Francis W. Child, Eagle Bend, Minn., assignor to Child Laboratories Inc., Cody, Wyo.

Filed Jul. 21, 1980, Ser. No. 170,732
Int. Cl.³ F41H *5/08*
U.S. Cl. 109—29 38 Claims

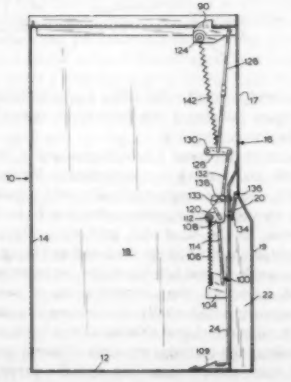
1. An apparatus useable as a support for accommodating sheet means and as a shield comprising: board means having a core, a plurality of sheet members surrounding the core, one of said sheet members having a generally flat outside surface providing a first side of the board means for accommodating sheet means, a plurality of rib means secured to another of said sheet members providing a second side of the board means, said second side being opposite the first side, means attached to the board means for holding the sheet means on said surface, hand grip means attached to a portion of the board means, and fluid dispensing means mounted on the hand grip means, said dispensing means having fluid discharge means, and actuator means operable to allow fluid to be dispensed into the atmosphere via the fluid discharge means.

4,442,781

DEPOSIT BOX

Leonard A. Fish, Chicago, Ill., assignor to Avco Corporation, Huntsville, Ala.

Filed Dec. 5, 1978, Ser. No. 966,583
Int. Cl.³ E05G *1/026*
U.S. Cl. 109—53 2 Claims



1. The combination of a box, formed with a deposit chamber and an escrow-chamber, and a removable cover, said combina-

tion being adapted to be advanced into or retracted from an automatic teller,

said removable cover comprising

a top sheet,

a swingable gate pivotally mounted under said sheet and adapted to swing to provide access to said deposit-chamber, said gate being formed to provide a deposit-chamber door,

said gate being further formed with a depressing portion,

a gate cam lock for holding said gate in closed position but operable to permit opening and closing of the deposit-chamber door,

a key-operated cover lock operable to release said gate cam lock,

and means sensitive to linear displacement of said cover relative to said automatic teller for opening or closing said deposit-chamber door,

said box comprising

a manually operable internal door between the chambers,

an external door for the escrow chamber,

means including a linkage-control cam and a linkage for opening and closing said external escrow-chamber door when said linkage-control cam moves to first and second limit positions, respectively, and safety interlock means responsive to said open position of said internal door for restraining said linkage to hold said linkage-control cam firmly in said first limit position to prevent the cover from assuming an assembled condition relative to said box,

said cover normally fitting on said box and placing said depressing surface and control element in cooperative relationship as the cover moves toward the assembled condition with the box, thereby to permit both escrow-chamber door and deposit-chamber door to open and close together, unless said linkage-control cam is held firmly in said first limit position by reason of the manually operable internal door being open, in which case the interlock responds.

4,442,782

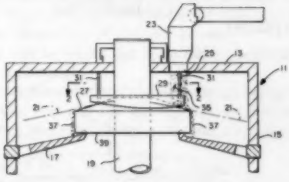
FEED DISTRIBUTOR FOR MULTIPLE HEARTH FURNACE

Frank Lilley, Palo Alto, Calif., and Clarence S. Rankin, deceased, late of San Francisco, Calif. (by Susan L. Rankin, executrix), assignors to Lurgi Corporation, River Edge, N.J.

Filed Jul. 16, 1982, Ser. No. 398,844

Int. Cl.³ F23G 5/04

U.S. Cl. 110—225 **9 Claims**



1. A material feed distributor for use in a furnace having at least one hearth, a central vertical shaft rotatable within the furnace and a roof over said hearth defining a material inlet, said feed distributor comprising a conical table feeder attached to said central vertical shaft for rotation therewith, said conical table feeder including a conical surface defining at least one opening therethrough, said opening being positioned radially outward from said central vertical shaft substantially the same distance as is said material inlet whereby, upon rotation of said table with said shaft, said opening is periodically in vertical alignment with said material inlet; a convolute plow fixed to said furnace at a position above said table feeder, said convolute plow being generally concentric within said table feeder and extending around the major portion thereof.

4,442,783

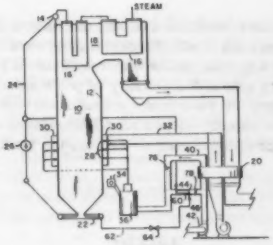
TEMPERING AIR HEATING ON PULVERIZING HIGH MOISTURE FUELS

Thomas L. Pajonas, Bristol; Gerald F. Barcikowski, West Simsbury, and Andrew J. Ennaco, Simsbury, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 20, 1982, Ser. No. 410,178

Int. Cl.³ F23K 1/04

U.S. Cl. 110—347 **1 Claim**



1. In a combustion system for burning a moisture containing pulverized fuel having a mill wherein the fuel to be burned is pulverized and dried, a furnace formed of a plurality of water-cooled tube walls disposed between an inlet and an outlet header and defining a chamber wherein the dried pulverized fuel is burned thereby generating hot flue gas, cooling circuit means including circulating pump means interconnecting the inlet and outlet headers for circulating cooling water through the tubes forming said tube walls, burner means associated with said furnace for receiving the pulverized fuel entrained in primary air from the mill, an air heater for passing said primary air in heat exchange relationship with said hot flue gas thereby preheating said primary air, first duct means for supplying ambient primary air to said air heater, second duct means for conveying said preheated primary air from said air heater to the mill, and third duct means having flow damper means disposed therein interconnecting said first duct with said second duct for conveying ambient tempering air around said air heater and remixing the tempering air with said preheated primary air; a method of operating said combustion system comprising:

(a) measuring the temperature of the mixture of pulverized fuel and primary air leaving the mill;

(b) closing the flow damper means disposed in said third duct means whenever the measured mixture temperature drops below a preselected minimum thereby reducing the flow of tempering air therethrough to a leakage flow leaking past the closed flow damper means; and

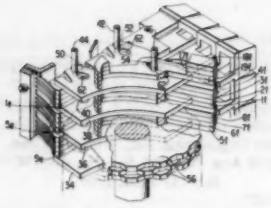
(c) circulating water from the water-cooled tube walls inlet header in heat exchange relationship with the tempering air leakage flow leaking past the closed flow damper means in said third duct means thereby preheating the tempering air leakage flow and thence returning the water to the water-cooled tube walls cooling circuit at a location upstream of the circulating pump means.

4,442,784

VERTICALLY STACKED COMPONENTS IN A CONTROL MODULE FOR A SEWING MACHINE

William Weisz, Tenafly, and Raymond S. Tyburcy, Middletown, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Dec. 14, 1982, Ser. No. 449,718
Int. Cl.[3] D05B 3/02
U.S. Cl. 112—158 C 9 Claims



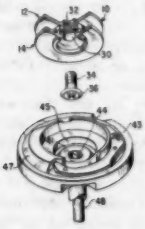
1. In a control module for a sewing machine, multiple rows of push-buttons each of which includes a rearward extension, a plurality of spaced apart plates which separate the push-button extensions into sets, and a plurality of posts upon which the plates are affixed, the push-button extensions in each of the said sets being contiguously stacked for relative sliding movement, and each set being supported on a separating plate.

4,442,785

SEWING MACHINE BOBBIN FOR A VERTICAL AXIS HOOK

Charles R. Odermann, Montville, and Thaddeus J. Zylbert, Morris Plains, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed May 24, 1982, Ser. No. 381,268
Int. Cl.[3] D05B 59/00, 57/04
U.S. Cl. 112—279 7 Claims



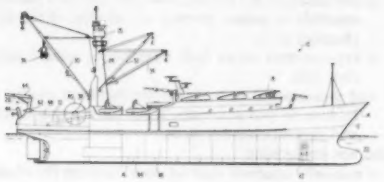
1. In combination, a driving clutch member, and a bobbin rotatable thereby for bobbin winding, the bobbin including a top flanged section and a bottom flanged section at least one of which includes a hub portion upon which sewing thread may be wound and each of which includes a hole on the rotational axis of the bobbin, the bobbin also including a drivable clutch member with an elongate threaded portion which extends through the hole in the bottom section and into threaded engagement with the top section in the hole therein, the drivable clutch member being formed with an enlarged head end portion which engages said bottom section to hold the sections in an assembled relationship, the head end portion of the drivable clutch member including one or more slots wherein the other clutch member is received to establish a driving connection between the clutch members.

4,442,786

FISHING VESSEL

Craig Conners, San Diego, Calif., assignor to Capt. Conners Inc., D.C.

Continuation of Ser. No. 170,226, Jul. 18, 1980, abandoned. This application May 10, 1982, Ser. No. 377,272
Int. Cl.[3] B63B 35/14
U.S. Cl. 114—255 14 Claims



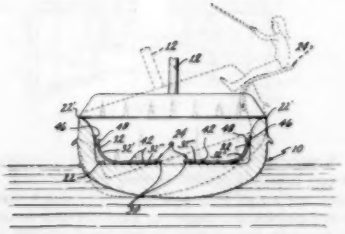
1. An oceanic fishing system comprising;
a ship having a main propulsion system and an auxiliary bow thrustor, said bow thrustor providing forward as well as lateral thrust;
a stern working deck;
a net deploying and retrieving drum disposed on said stern working deck and positioned to deploy and retrieve a purse-seine net wrapped on said drum over the stern of said ship,
means to attach and selectively move a free end of said purse-seine net relative to said stern,
a brailing crane disposed on one side of said stern working deck movable over said stern and pivotable into said net to brail fish, said brailing crane having a rigid hydraulically extensible arm urged into said net, said arm pivotable over said stern working deck, and
fish handling means including a hopper disposed on an opposite side of said stern working deck from said brailing crane receiving fish from said hydraulic brailing crane and transporting them for processing and on-board storage.

4,442,787

BOAT PLATFORM HAVING OUTBOARD AND INBOARD POSITIONS

Steven H. Curran, 7514 W. 91st St., Los Angeles, Calif. 90045, and Alfred G. Kumalae, 2626 Clay, Newport Beach, Calif. 92660

Filed Jan. 29, 1982, Ser. No. 343,779
Int. Cl.[3] B63B 17/00
U.S. Cl. 114—363 6 Claims



1. As an article of manufacture, an appurtenance for a boat having a hull with sides including an upper edge and a cockpit having a floor, in combination, a frame means comprising a self stowable and extendable seat platform, means providing a hinged mounting of the frame to the side of the boat whereby the frame means can be rotated about the hinged mounting to

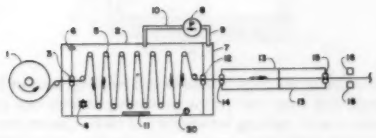
an outboard position extending outwardly from the side of the boat and can be roatated to an inward position inboard of the boat, the hinged mounting being positioned substantially midway between the upper edge of a side and the floor, the frame means having substantially L-shaped end portions shaped to contour to the inside and top of the side of the boat whereby in the outboard position it is supported in cantilevered posture solely by the side of the boat, and whereby in the inboard position said frame means is nested against the floor and an inner side of the boat as and for a seat and backrest therein.

4,442,788

CONTINUOUS GRADIENT DYEING OF PLASTIC RIBBON

Robert Weis, Leominster, Mass., assignor to Foster Grant Corporation, Del.

Filed Sep. 30, 1982, Ser. No. 429,653
Int. Cl.³ B05C *3/02*
U.S. Cl. 118—405 **11 Claims**



1. An apparatus for producing in a continuous manner a gradient dyed plastic ribbon which comprises:

(a) a feed reel which continuously unwinds and feeds a continuous ribbon of a plastic material;

(b) a take-up reel which continuously winds said ribbon after it has been gradient dyed;

(c) a ribbon drive means which drives the take-up reel and supplies a driving force for the forward movement of the ribbon;

(d) a dye tank containing a dye bath solution, said dye tank having associated therewith a liqud level control means which varies the liquid level of the dye bath repetitively with time between two pre-determined levels;

(e) a rinsing unit containing rinsing water through which the ribbon is allowed to travel to rinse off adhering dye solution from the surface of the ribbon; and

(f) a drying unit in which the dyed ribbon is dried while it passes therethrough;

the relative arrangement of the above elements being such that between the feed reel and the take-up reel the ribbon travels through the dye tank, the rinsing unit, and the drying unit in this sequence.

4,442,789

PARTICLE MOVING AND DISPENSING SYSTEM

Robert G. Pirwitz, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 16, 1982, Ser. No. 418,856
Int. Cl.³ G03G *15/08*
U.S. Cl. 118—653 **4 Claims**

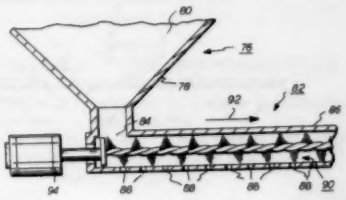
1. An apparatus for developing an electrostatic latent image recorded on a photoconductive member used in an electrophotographic printing machine, including:

a housing defining a chamber for storing a supply of developer material comprising at least carrier granules and toner particles therein;

means, defining an open ended chamber, for storing a supply of toner particles therein;

a tubular member having an entrance port in communication with the open end of the chamber in said storing means to receive toner particles therefrom and a plurality of substantially equally spaced exit ports for dispensing toner particles therefrom into the chamber of the housing storing the developer material therein;

means for moving the toner particles received in said tubular member from the entrance port to the exit ports therein



for dispensing the toner particles therefrom into the chamber of the housing storing the developer material therein, said moving means comprising a support mounted rotatably in said tubular member, and a multiplicity of flexible fibers mounted on said support in a spiral configuration and extending outwardly therefrom with the free end portions thereof being closely adjacent to the interior surface of said tubular member; and

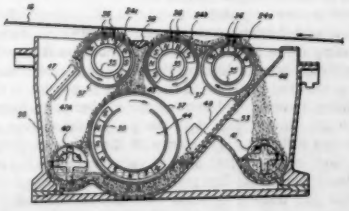
means for periodically deflecting and releasing the free end portions of said flexible fibers to prevent caking and clogging of the toner particles moving in said tubular member.

4,442,790

MAGNETIC BRUSH DEVELOPMENT APPARATUS

John P. Swapceinski, Bergen; Leon A. Rose, Honeoye Falls; Stewart D. Probst, Rush; Donald G. McKeown, Warsaw, and Thomas K. Hilbert, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,577
Int. Cl.³ G03G *15/09*
U.S. Cl. 118—657 **7 Claims**



1. In a development apparatus having three magnetic brushes which sequentially apply toner to an electrostatic image on a moving image-bearing member, the improvement comprising:

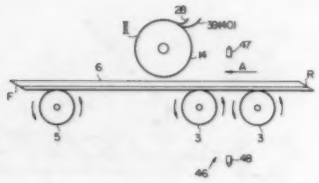
(a) means for rotating the two upstream brushes counter-current with respect to the movement of the image-bearing member, said upstream brushes having overlapping magnetic fields for transporting developer from one brush to the other while the developer contacts an electrostatic image on such image-bearing member; and

(b) means for rotating the downstream brush co-current with respect to the movement of the image-bearing member to develop any incompletely developed portions of such electrostatic image.

4,442,791
ADHESIVE COMPOUND COATING APPARATUS

Masami Adachi, Higashimurayama; Hirato Shimasaki, Tokyo; Isao Nomizu, Kaminokawa, and Taketo Matsuzaki, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 25, 1983, Ser. No. 479,132
Claims priority, application Japan, May 13, 1982, 57-80992
Int. Cl.³ B05C *1/16*
U.S. Cl. 118—669 **4 Claims**



1. An adhesive compound coating apparatus for coating an adhesive compound on leading and trailing beveled end faces of a rubber strip material, the leading and trailing beveled end faces being bias-cut in parallel with each other with respect to the upper and lower surfaces of the rubber strip material, comprising:

conveyor means for conveying the rubber strip material in its longitudinal direction;

a coating roller disposed to have a center axis substantially perpendicular to the longitudinal direction of said rubber strip material and rotatable about its center axis, the coating roller being movable with respect to said conveyor means between a first position having the center axis of the coating roller positioned below the upper surface of said conveyor means and a second position having the peripheral surface of the coating roller positioned above the upper surface of said conveyor means;

drive means for driving the coating roller to rotate about its center axis;

adhesive compound supplying means for supplying and applying the adhesive compound on the peripheral surface of said coating roller;

detecting means operative to detect the positions of the rubber strip material conveyed by said conveyor means and produce output signals; and

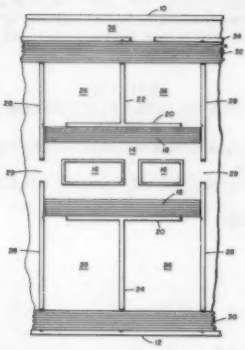
control means responsive to the output signals delivered from said detecting means and operative to move said coating roller toward said second position from said first position when the leading beveled end face of the rubber strip material is advanced to said coating roller so that the leading beveled end face of the rubber strip material is brought into contact with the peripheral surface of said coating roller and is coated with the adhesive compound by said coating roller, and operative to move the coating roller toward said first position from said second position when the trailing beveled end face of the rubber strip material is advanced to said coating roller so that the trailing beveled end face of the rubber strip material is brought into contact with the peripheral surface of said coating roller and is coated with the adhesive compound by said coating roller.

4,442,792
HOG FINISHING BUILDING

Arthur C. Nehring, 107 Michigan, Iowa Falls, Iowa 50126

Continuation of Ser. No. 875,407, Feb. 6, 1978, abandoned. This application Nov. 19, 1979, Ser. No. 95,634
Int. Cl.³ A01K *1/00*
U.S. Cl. 119—16 **6 Claims**

1. A hog finishing building for growing and finishing hogs and the like, said building comprising a pair of side walls, end walls joined to said side walls to provide an enclosure, a roof covering said enclosure, and a plurality of partitions within said enclosure, some of said partitions being positioned substantially parallel to said side walls while others of said partitions are positioned transversely thereto, said partitions being arranged to form a plurality of separate feed areas, rest areas,

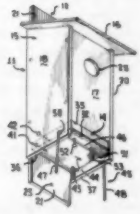


and pathways for the hogs housed in said building, each of said feed areas, rest areas and pathways having at least one normally open access opening between it and each adjacent one of said areas and pathways so as to provide for free movement of a hog in any one of said areas or pathways directly into an adjacent one of said areas or pathways without passing through any other area or pathway.

4,442,793
EASY-TO-CLEAN BIRDHOUSE

Charles D. Overpeck; Dorothy S. Overpeck, and George G. Overpeck, all of 725 Forest Ridge Dr., Great Falls, Va. 22066

Filed Jul. 9, 1982, Ser. No. 396,725
Int. Cl.³ A01K *31/00*
U.S. Cl. 119—23 **2 Claims**



1. An easy-to-clean birdhouse comprising a body defining a chamber, a roof closing an upper end portion of said body and said chamber, a floor closing a lower end portion of said body and said chamber, means in said body for defining a bird ingress and egress opening relative to said chamber whereby birds might build a nest within said chamber upon said floor, means for normally maintaining said floor normal to a longitudinal axis of said chamber whereby said floor is normally disposed essentially horizontally when said birdhouse is appropriately supported in its use position, said maintaining means including a rod of flexible material spanning and underlyingly supporting said floor, said rod passing through opposite openings in said body lower end portion, at least one end of said rod being bent transversely to the rod axis to prevent the accidental withdrawal of said rod from said openings but said one rod end being capable of being rebent into realignment with the

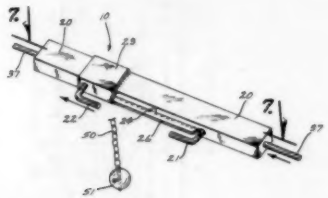
rod axis to permit the intentional withdrawal of said rod from said openings and the subsequent opening of said floor whereby a nest can be removed through said opened lower end portion, means for pivotally/slidably connecting said floor to said body lower end portion whereby upon the withdrawal of said rod said floor can pivot and/or slide to open said chamber lower end portion, and said pivotally/slidably connecting means are two pairs of spaced pins at opposite sides of said body lower end portion each receiving therebetween a lateral edge of said floor.

4,442,794

APPARATUS FOR CATCHING CATTLE

Frank W. Redmann, Rte. 2, 1061 Hwy. 97 South, Athens, Wis. 54411

Filed May 19, 1982, Ser. No. 379,666
Int. Cl.³ A01K *1/06, 1/08*
U.S. Cl. 119—115 **8 Claims**



1. Apparatus for automatically tethering a cow in a tie stall, said tie stall being of a type including a milking pad for providing a place for a cow to stand and having partition means for separating a feed bunk from a milking pad, and feed bunk access means for allowing the head and neck of a cow to pass through from the milking pad to the feed bunk and preventing the rest of the cow from passing therethrough, whereby a cow can stand on the milking pad and eat feed in the feed bunk, said tethering apparatus comprising:

a frame means for being operatively connected to said partition means below said access means;

collar means for extending around the neck of a cow;

tripping means connected to said collar for hanging below said collar means, said tripping means includes an enlarged member on one end thereof; and

catching means operatively attached to said frame for automatically connecting the tripping means to said frame upon contact of said tripping means with said catching means, whereby when a cow having a collar means and tripping means connected thereto sticks its head through the access means, it will be automatically tethered in that position, said catching means comprises an L-shaped first rod rigidly connected to said frame means and extending toward said milking pad and having a free end;

a second L-shaped rod extending toward said milking pad and having a free end thereon;

mounting means for slideably attaching said second L-shaped rod to said frame means;

rod biasing means for biasing said second L-shaped rod to a first position wherein the free ends of said first and second L-shaped rods are substantially in abutment;

means for locking said second L-shaped rod in a second position spaced from said first position whereby the free ends of said first and second L-shaped rods are spaced a substantial distance apart;

lock biasing means connected to said frame means for biasing said locking means to its locking position;

said locking means being disposed between said first and second L-shaped rods in the locked position thereof when the second L-shaped rod is in the second position thereof, whereby contact of the tripping means with the locking means will unlock the locking means and automatically allow the rod biasing means to move the second L-shaped rod to the first position thereof thereby causing the first and second L-shaped rods to be disposed around the tripping means with the collar means disposed above the L-shaped rods and the enlarged member below the L-shaped rods, said enlarged member being of a size too large to pass through the space between the L-shaped rods and the frame when the second L-shaped rod is in the first position thereof; and

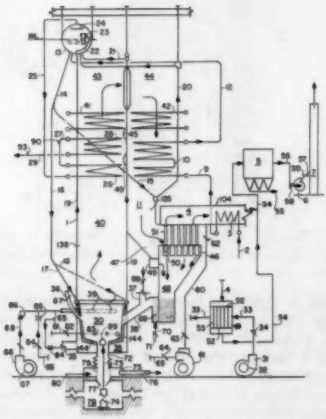
resetting means for releasing a tethered cow and resetting said catching means for subsequent use.

4,442,795

RECIRCULATING FLUIDIZED BED COMBUSTION SYSTEM FOR A STEAM GENERATOR

Charles Strohmeyer, Jr., Gladwyne, Pa., assignor to Electrodyne Research Corporation, Gladwyne, Pa.

Continuation-in-part of Ser. No. 371,528, Apr. 26, 1982. This application Dec. 8, 1982, Ser. No. 448,028
Int. Cl.³ F22B *1/00*
U.S. Cl. 122—4 D **8 Claims**



1. A steam generator having a feedwater inlet and steam outlet and coolant filled heat absorption circuits disposed in between, a vertical up flow furnace, walls for said furnace including a first portion of said heat absorption circuits, a combustion system contained by said furnace comprising a first ignition and reaction zone at the bottom of said furnace, means for continuously feeding solid fuel and air to said first zone sustaining combustion and generating hot flue gas, a second zone above said bottom of said furnace including means for admission of secondary gas to said furnace, means for overflowing said hot flue gas and said solid fuel from said first zone along with recycled solids up into said second zone to form a combined gas stream, means to maintain velocity of the combined gas stream in and above said second zone sufficient for entraining in said combined gas stream a substantial portion of said overflowed solid fuel and recycled solids, additional portions of said heat absorption circuits disposed horizontally at the outlet of said furnace and provided with an enclosure interconnected with said furnace walls, means causing the volumetric relationship of said enclosure and gas temperature to drop across components of said additional portions for reducing velocity of said combined gas stream between said components below entrainment level for part of said entrained solids permitting said solids part to settle in a fluidized state, means for separation of said solids remaining in said main path of said combined gas stream at a downstream location, means for continuously draining said settled solids port away from the

main path of said combined gas stream, means to recycle said drained away settled solids part and said separated remaining solids between said first and second zones, and means to exhaust said main path of said combined gas stream after said remaining solids separation.

4,442,796

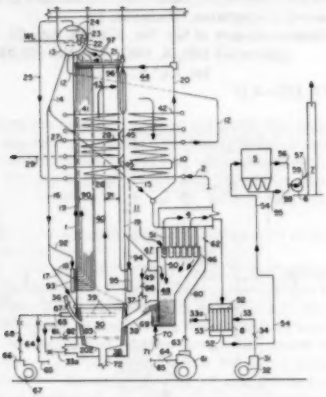
MIGRATING FLUIDIZED BED COMBUSTION SYSTEM FOR A STEAM GENERATOR

Charles Strohmeyer, Jr., Gladwyne, Pa., assignor to Electrodyne Research Corporation, Gladwyne, Pa.

Continuation-in-part of Ser. No. 448,028, Dec. 8, 1982. This application Jan. 7, 1983, Ser. No. 456,586

Int. Cl.³ F22B 1/00

U.S. Cl. 122—4 D 5 Claims



1. A steam generator having a feedwater inlet and steam outlet and coolant filled heat absorption circuits disposed in between, a vertical up flow furnace, walls for said furnace including a first portion of said heat absorption circuits, a combustion system contained by said furnace comprising a first ignition and reaction zone at the bottom of said furnace, means for continuously feeding solid fuel and air to said first zone sustaining combustion and generating hot flue gas, a second zone above said bottom of said furnace including means for admission of secondary gas to said furnace, said means for continuously feeding solid fuel concentrating supply of said solid fuel at location/s of said first zone below said secondary gas admission means, said means for feeding air adapted to discharge air uniformly, tangentially and in a distributed manner above and throughout said furnace bottom in a directional pattern driving said solid fuel along with recycled solids as a fluidized mixture migrating in a concentric, essentially horizontal, retraceable path following the periphery of said furnace walls below said second zone, displacement means for overflowing said mixture from said first zone into said second zone generating a screwlike trace through said first zone, said means for admission of secondary air adapted to admit gas at multiple points spaced in a horizontal, uniform, geometric pattern, said secondary gas flowing into said second zone in a substantially horizontal plane optionally tipped slightly up or down and in an essentially transverse direction to said path of said fluidized mixture containing said fuel, each of said multiple points tangentially in line with the same relative side of an imaginary horizontal circle at the center of said multiple points and disposed for sustaining said screwlike trace of said mixture from said first zone, said secondary gas having admission velocity sufficient for redirecting said mixture and uniformly distributing said fuel and said air throughout said first and said second zones, means to maintain velocity of the combined gas stream in and above said second zone sufficient for entraining in said combined gas stream a substantial portion of said overflowed recycled solids and solid fuel, means for separation of said substantial solids portion from said combined gas stream downsteram of said furnace, external means for recycling said separated solids to said second zone as said recycled solids, and means for exhausting said combined gas stream after said solids separation.

4,442,797

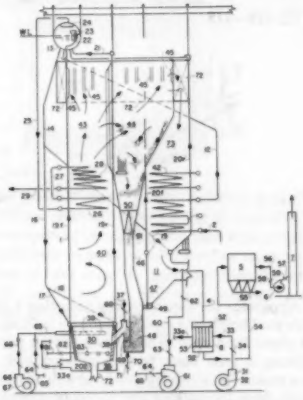
GAS AND PARTICLE SEPARATION MEANS FOR A STEAM GENERATOR CIRCULATING FLUIDIZED BED FIRING SYSTEM

Charles Strohmeyer, Jr., Gladwyne, Pa., assignor to Electrodyne Research Corporation, Gladwyne, Pa.

Filed Jan. 24, 1983, Ser. No. 462,016

Int. Cl.³ F22B 1/00

U.S. Cl. 122—4 D 6 Claims



1. A steam generator having a feedwater inlet and steam outlet and coolant filled heat absorption circuits disposed in between, a vertical up flow furnace, walls for said furnace including a first portion of said heat absorption circuits, a combustion system contained by said furnace comprising a first ignition and reaction zone at the bottom of said furnace, means for continuously feeding solid fuel and air to said first zone sustaining combustion and generating hot flue gas, a second zone above said bottom of said furnace including means for admission of secondary gas to said furnace, means for overflowing said hot flue gas and said solid fuel from said first zone along with recycled solids up into said second zone to form a combined gas stream, means to maintain velocity of the combined gas stream in and above said second zone in a relatively constant range and sufficient for entraining in said combined gas stream a substantial portion of said overflowed solid fuel and recycled solids, said combustion reaction continuing in and above said second zone consuming said solid fuel, said recycled solids in said substantial portion maintaining said combined gas stream in a suppressed and controlled temperature range, an enclosure for said combined gas stream at said furnace outlet to continuously expand said combined gas stream in an upward direction, said enclosure forming an expanding plenum and a baffle at the outlet end, said enclosure configuration and said combined gas stream expansion causing said velocity of said combined gas stream in said plenum to decrease sufficiently enabling inertial separation and settlement of most of said solids entrained in said combined gas stream, orificed ports uniformly distributed in said baffle comprising means to draw said combined gas stream discharging from said furnace up into said expanding plenum in an even and striated flow path, a hopper offset from the horizontal plane of said furnace at the bottom of said plenum, at least a portion of said combined gas stream discharge passing over said hopper and

directing said separated solids during settlement toward said hopper for collection, means for recycling said collected solids as recycled solids between said first and second zones, means for collecting said combined gas discharged from said orifices and passing said combined gas through a convection section comprising a second portion of said heat absorption circuits, for cooling said combined gas, and means for disposing of said cooled combined gas.

4,442,798

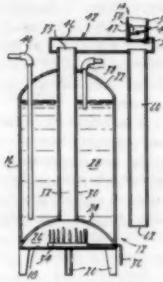
VENT ASSEMBLY

Theodore J. Zanias, Long Beach, Calif., assignor to Masco Corporation, Taylor, Mich.

Continuation of Ser. No. 352,186, Feb. 25, 1982, abandoned, which is a continuation of Ser. No. 182,832, Aug. 29, 1980, abandoned. This application Jun. 27, 1983, Ser. No. 508,424

Int. Cl.³ F22B *5/00*

U.S. Cl. 122—17 **2 Claims**



1. A vent assembly for venting into the atmosphere gasses of combustion from a flue exhaust port of a heater appliance disposed within an enclosure and having a burner, a tank disposed above the burner and at least one flue extending vertically through the tank and interconnecting a burner compartment and said flue exhaust port, said vent assembly comprising:

an exhaust duct having two ends, one of said ends being connected to said flue exhaust port and the other of said ends being open to the atmosphere outside said enclosure;

selectively operative closure means selectively opening said duct for the flow of said gasses of combustion therethrough when said burner operation is discontinued;

said selectively operative closure means comprises a thermally responsive damper constructed to respond to the temperature within said duct and opening when gasses within said exhaust duct are above a predetermined temperature;

a relief duct connected to said exhaust duct at a point along the flow path of said gasses of combustion upstream of said closure means; and

a continuously open relief aperture in said relief duct disposed at a height between the height of said burner and the height of said flue exhaust port but substantially closer to the height of said burner than to the height of said flue exhaust port.

4,442,799

HEAT EXCHANGER

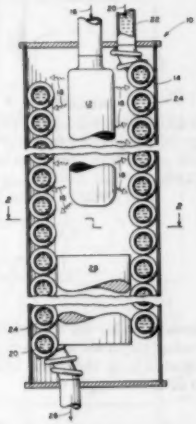
Laurence B. Craig, 116 Duck Pond Rd., Glen Cove, N.Y. 11542, and Alfred J. Farina, 1939 Anita Ct., Baldwin, N.Y. 11510

Filed Sep. 7, 1982, Ser. No. 415,402

Int. Cl.³ F22B *21/00*

U.S. Cl. 122—250 R **1 Claim**

1. An improved heat exchanger comprising, in combination, an elongated-shaped means operatively arranged to provide a source of heat eminating radially therefrom and along the length of said elongated shape, a fluid for use in heat exchange with said heat source, a combination cylindrical housing having an exit opening at one end and helical coil disposed in a clearance position in surrounding relation to and along said elongated-shaped heat source for the flowing through said helical coil of said fluid incident to establishing said heat exchange between said heat source and said fluid, said helical coil being in physical contact with said cylindrical housing and having surface helical fluting thereabout extending for the length thereof and arranged with the individual helical turns thereof in adjacent relation to each other so as to bound a compartment within said cylindrical housing about said heat source, a plug located at the end of said compartment to block



the flow of air centrally therethrough directly to said exit opening of said cylindrical housing so as to assist in producing air movement radially outwardly therefrom into contact with said helical coil, and pressure means urging air through movement in said compartment for enhancing the transfer of heat from said heat source to said flowing fluid along at least one path that traces along the helical fluting of said helical coil and a second path that traces along the clearance between said helical coil and said cylindrical housing, whereby there is an optimum heat exchange which is provided by heat transfer from said heat source to said two paths of circulating air and from said circulating air to said flowing fluid.

4,442,800

SINGLE DRUM ALL-WELDED BOILER

Thomas P. Seifert, and Warren E. Longfield, both of Wadsworth, Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed May 3, 1982, Ser. No. 374,358

Int. Cl.³ F22B *37/18*

U.S. Cl. 122—379 **8 Claims**

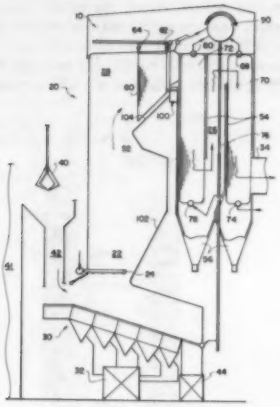
1. A single drum all-welded boiler system for a furnace having a combustion chamber and a convection pass downstream of the combustion chamber and connected to the combustion chamber in a transition area, comprising:

a superheater disposed in the transition area having an inlet and an outlet;

an economizer disposed in the convection pass having an inlet and an outlet;

a boiler disposed in said convection pass between said economizer and said superheater, said boiler comprising at least one modular unit made up of a plurality of tubes welded at the bottom to a common inlet header and at the top to a common outlet header, wherein the boiler and economizer modular units have extended surface in the form of fins welded on each side of the tubes parallel to the direction of gas flow and have vertical upward flow of

fluid in the tubes; a plurality of unheated downcomer pipes, not exposed to combustion gas, extending vertically downward from a single steam drum to supply water to the lower furnace wall headers and to the lower headers of the boiler modules; and



said single steam drum having at least one inlet connected to said economizer outlet and at least one outlet connected to said superheater inlet; the drum located in an area not exposed to combustion gas flow.

4,442,801

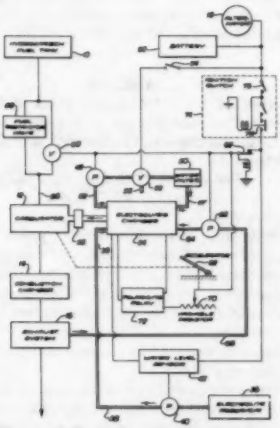
ELECTROLYSIS FUEL SUPPLEMENTATION APPARATUS FOR COMBUSTION ENGINES

John D. Glynn, One Century Plz., 2029 Century Park East, Los Angeles, Calif. 90067; Daniel R. Glynn, 2215 El Arbolito Dr., Glendale, Calif. 91208, and Arthur R. Andrews, 1049 Alcalde Dr., Glendale, Calif. 91207

Filed Dec. 16, 1981, Ser. No. 331,246

Int. Cl.³ F02B *43/10*

U.S. Cl. 123—3 **25 Claims**



1. In a combustion engine including at least one combustion chamber, a hydrocarbon fuel tank, fuel delivery means for mixing said fuel with air and delivering said fuel/air mixture to said combustion chamber, throttle means for adjustably controlling said fuel delivery means, and a source of electrical potential energized by the operation of said engine, the improvement to said engine comprising:

a reservoir containing an electrolyte that is at least part water;

an electrolysis chamber;

an electrolyte feed line leading from said reservoir to said chamber, whereby said chamber is filled with said electrolyte;

a pair of electrodes disposed within said chamber and at least partially immersed in said electrolyte, each of said electrodes including a plurality of perforated horizontal electrode plates, said electrodes being electrically connected to opposite sides of said source of electrical potential, whereby said electrolyte is broken down to yield hydrogen and oxygen;

voltage means for varying the electrical potential applied to said electrode plates in response to adjustment of said throttle means thereby producing hydrogen and oxygen at a rate responsive to the adjustment of said throttle means;

fuel supplement delivery means for supplying said hydrogen and oxygen to said fuel delivery means;

pump means for blowing a pusher gas under positive pressure through a pusher gas manifold, whereby said gas rises through said chamber and sweeps said hydrogen and oxygen from said plates; and

a perforated pusher gas manifold extending throughout the entire bottom of said chamber beneath said electrodes to distribute said pusher gas horizontally throughout the bottom of said chamber whereby said pusher gas instantaneously sweeps hydrogen and oxygen from said plates and prevents a hazardous and unsafe accumulation of hydrogen and oxygen within said chamber.

4,442,802

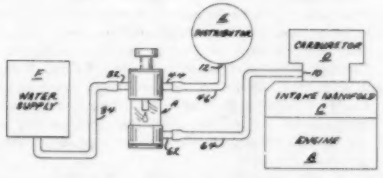
INTERNAL COMBUSTION ENGINE WATER INJECTOR

Earl H. Cook, 2 Chaparrel La., Rancho Palos Verdes, Calif. 90274, and Norman E. Booth, 7561 Keith Cir., La Palma, Calif. 90623

Filed Oct. 1, 1982, Ser. No. 432,181

Int. Cl.³ F02B *47/02*; F02D *19/00*

U.S. Cl. 123—25 L **1 Claim**



1. In combination with an internal combustion engine that has an intake manifold, a carburetor that has a vacuum passage therein, and a distributor that has a vacuum passage therein that controls a spark advance mechanism that forms a part of said distributor, a water injection assembly that includes:

a. a vertically positionable valve body that has a top and a bottom surface and a bore extending therebetween, a first transverse passage in said valve body, a first tubular member extending outwardly from said valve body in communication with said first transverse passage, a second tubular member that extends outwardly from said valve body and communicates with a downwardly extending passage therein;

b. a cylindrical valve member rotatably and sealingly supported in said bore, said valve member having a second transverse passage therein that lies in the same plane as said first passage, said second passage in communication with a downward passage in said valve member, and a circular recess in said bottom surface;

c. a base that includes a top surface and a bottom surface,

said top surface having a circular recess therein, a third tubular member that extends outwardly from said base;

d. first and second resilient rings mounted in said first and second recesses;

e. a cylindrical transparent shell that has first and second end portions disposed in said first and second recesses;

f. a U-shaped supporting clip that has first and second legs that engage said top and bottom surfaces of said valve body and base and force said cylindrical shell into pressure sealing contact with first and second resilient rings, said valve body cylindrical shell and base cooperating to define a confined space;

g. first, second and third tubes connected to said first, second and third tubular members, said first tube connected to a source of water, said second tube to said distributor, and said third tube to said passage in said carburetor, with said engine when operating creating a vacuum in said confined space to draw water into said confined space drop by drop, and the rate at which said drops enter said confined space dependent on the positioning of said second transverse passage relative to said first transverse passage, and said drops flowing through said third tube to said intake manifold to be subsequently vaporized in the cylinders of said engine to augment the pressure to which the pistons therein are subjected.

4,442,803

LIGHT METAL CYLINDER HEAD FOR INTERNAL COMBUSTION ENGINES

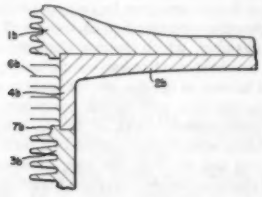
Paul Tholen, Bergisch Gladbach, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Division of Ser. No. 187,519, Sep. 15, 1980, Pat. No. 4,387,678. This application Feb. 23, 1983, Ser. No. 468,898

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937788

Int. Cl.³ F02F *1/26*

U.S. Cl. 123—41.69 **1 Claim**



1. A light metal cylinder head arrangement in combination with combustion chambers of internal combustion engines, comprising in combination:

a light metal cylinder head having a bottom directed toward an associated combustion chamber, the cylinder head having an axially extending, annular shoulder extending toward the combustion chamber, which shoulder has a first surface facing radially inward and a second surface facing axially;

a cylinder barrel, spaced from the cylinder head, and having an axially extending annular shoulder extending toward the cylinder head, the shoulder of said cylinder barrel having a first surface facing radially inward and a second surface facing axially, the shoulder of said cylinder barrel being outboard of an axially facing surface;

an insert of ferris metal disposed between the cylinder head and cylinder barrel; the insert including a plate portion and an annular portion integral therewith; the plate portion having a flat surface abutting the bottom of the cylinder head and a concave surface facing the combustion chamber; the annular portion extending from the plate portion toward the cylinder barrel with the entire plate portion being inboard of the annular portion; the annular portion having a thickness no more than about three times the thickness of the shoulders as measured across the second surfaces thereof; the insert being in abutment with the first surfaces of the shoulders and the axially facing surface of the cylinder barrel; whereby during engine operation thermal expansion urges the insert and cylinder head snugly against one another.

4,442,804

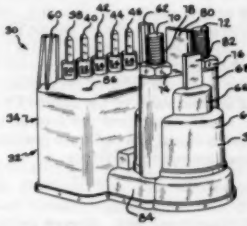
GLOW PLUG CONTROLLER FOR DIESEL ENGINES

Richard L. Morgan, Utica, and David A. Pickett, Monroe, both of Mich., assignors to Allied Corporation, Morristown, N.J.

Filed Jul. 14, 1982, Ser. No. 398,006

Int. Cl.³ F02N *17/00*

U.S. Cl. 123—145 A **13 Claims**



1. A control device for use with a compression-ignition engine for energizing at least one glow plug when the engine is being started, comprising:

a source of electrical current;

first switch means for controlling the supply of said current to said device;

first relay contact means responsive to first relay coil means interposed between said source of electrical current and said at least one glow plug for energizing said glow plug when said first relay coil means is energized;

said first relay coil means being operably connected to said source of electrical current when said engine is being started, and electrically connected in series with a second temperature-actuated switch means which opens upon an increase in temperature and having second associated electrical heater means, and with a third temperature-actuated switch means which opens upon an increase in temperature and having a third associated electrical heater means and with a second relay contact means responsive to a second relay coil means;

said second relay coil means being connected electrically in parallel with said third temperature-actuated switch;

said third temperature-actuated switch being adapted to electrically open at a first predetermined time interval after said switch means is actuated to supply said current to said device;

said first relay coil means being energized when said switch means is actuated to supply said current and de-energized at said first predetermined time;

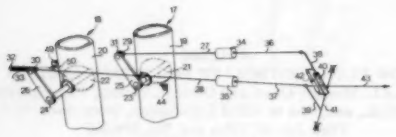
said second relay coil means being energized at said first predetermined time and remaining energized until said switch means is actuated to remove said current from said device.

4,442,805

INTERNAL COMBUSTION ENGINE PROVIDED WITH A PLURALITY OF POWER UNITS

Toru Yamakawa, Hachioji, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00363, 371 Date Jul. 29, 1982, 102(e) Date Jul. 29, 1982, PCT Pub. No. WO82/01914, PCT Pub. Date Jun. 10, 1982
PCT Filed Nov. 30, 1981, Ser. No. 403,745
Claims priority, application Japan, Nov. 29, 1980, 55-168785; Nov. 29, 1980, 55-168790
Int. Cl.³ F02D 25/04
U.S. Cl. 123—198 F 1 Claim



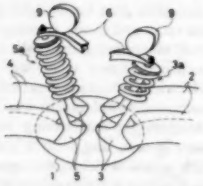
1. An internal combustion engine for a vehicle, which comprises a plurality of independent engine units including a primary engine unit and an auxiliary engine unit, and an output shaft, characterized in that the primary engine is connected to the output shaft and the auxiliary engine unit is connected to the output shaft through a clutch, that a control system is so arranged that when a throttle valve of the primary engine unit is fully opened, a throttle valve of the auxiliary engine unit is opened to a half open position and the throttle valve of the primary engine unit is closed to a half open position, thereafter both throttle valves are opened together.

4,442,806

VALVE DRIVING CONTROL APPARATUS IN AN INTERNAL COMBUSTION ENGINE

Masaaki Matsuura, Tokyo, and Yoshikatsu Nokano, Kawagoe, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,637
Claims priority, application Japan, Dec. 3, 1981, 56-194815
Int. Cl.³ F01L 1/34; F02D 13/06
U.S. Cl. 123—198 F 5 Claims



1. A valve driving control apparatus for an internal combustion engine having a crankshaft and a power cylinder provided with a plurality of intake or exhaust valves, comprising:

(a) an engine speed sensor means for generating an engine speed signal indicative of the rotational speed of the crankshaft;

(b) a camshaft driven by the crankshaft;

(c) a plurality of cam assembly means associated with said camshaft for opening one of the intake and exhaust valves in accordance with the rotation of said camshaft at a predetermined valve timing;

(d) a change-over means associated with at least one of said cam assembly means for selectively disabling an operation of opening the valve upon receiving a valve drive control signal; and

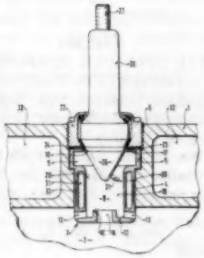
(e) a control means for producing said valve drive control signal in response to said engine speed signal, said control means being arranged to have a first threshold engine speed level which is used upon production of said valve drive control signal and a second threshold engine speed level which is used upon stopping of said valve drive control signal, thereby providing a hysteresis characteristic to a change-over operation between an operative and an inoperative state of the valve.

4,442,807

METHOD FOR IGNITING LEAN FUEL-AIR MIXTURES AND AN APPARATUS TO PERFORM THE METHOD

Reinhard Latsch, Vahingen; Hans Schlembach, Mühlacker, and Dieter Scherenberg, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 141,437, Apr. 17, 1980, abandoned.
This application Jul. 30, 1982, Ser. No. 403,902
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1979, 2916285
Int. Cl.³ F02B 19/18, 31/00
U.S. Cl. 123—263 3 Claims



1. A method for igniting lean fuel-air mixtures in an ignition chamber disposed in a combustion chamber wall of an internal combustion chamber, which ignition chamber communicates with a main combustion chamber via a plurality of overflow channels and having an ignition device igniting toward a wall of the ignition chamber, said method comprising the steps of:

during a compression stroke of the internal combustion engine introducing a first portion of a fresh charge comprising fuel and air from the main combustion chamber into the ignition chamber having a longitudinal axis and a rotationally symmetrical shape around said longitudinal axis through at least one first overflow channel,

delivering said charge introduced through at least one first overflow channel directly to a portion of the ignition chamber remote from the main combustion chamber,

establishing a contrary flow stream beginning in said remote portion of said ignition chamber towards an ignition chamber portion oriented toward the main combustion chamber, introducing a second portion of the fresh charge via at least one second overflow channel and discharging said second portion of the fresh charge tangentially in relation to a chamber wall portion surrounding said longitudinal axis into the ignition chamber on a side oriented toward the combustion chamber, and

establishing a fuel-air stream along the ignition chamber wall moving towards said first portion of a fresh charge and simultaneously rotating around said longitudinal axis of said ignition chamber, establishing between said first and said second portion of a fresh charge a boundary layer having a speed vector which in a longitudinal direction of the ignition chamber disappears to at least nearly zero, and establishing ignition of said introduced fuel at an outer periphery of the rotating stream in a location which is

closer to said boundary layer as to said at least one second overflow channel.

4,442,808

COMBUSTION CHAMBER FOR SPARK IGNITION INTERNAL COMBUSTION ENGINE

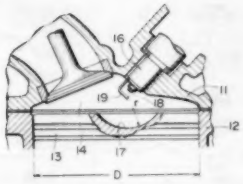
Saburo Tsutsumi, Yokohama; Kichihiko Dozono; Yutaka Matayoshi, both of Yokosuka, and Kazuya Kunii, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Dec. 10, 1980, Ser. No. 215,082

Claims priority, application Japan, Dec. 11, 1979, 54-171506[U]

Int. Cl.³ F02F *3/26*

U.S. Cl. 123—279 **6 Claims**



1. A combustion chamber for a spark ignition internal combustion engine comprising a cylinder bore, a piston reciprocating in said cylinder bore, a cylinder head having a non-spherical sinuous surface enclosing said cylinder bore and a spark plug disposed in said cylinder head, said piston having formed in a top thereof a volume formed by a part-spherical depression that has a surface which is so shaped and located as to permit a flame front during an initial stage of combustion to reach the entire surface of said depression substantially simultaneously, and wherein said spark plug has electrodes which extend into said combustion chamber by a distance less than a radius of curvature of said depression, in which the radius of curvature of said depression forms a ratio to that of the cylinder bore of 1:10 to 1:2, wherein the surface of said cylinder head bounds a volume which is substantially greater than said volume formed by said depression.

4,442,809

COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE WITH AN ACCUMULATION CHAMBER

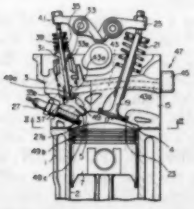
Hidetaka Nohira, Mishima; Sumio Ito, Susono, and Hisashi Oki, Numazu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 22,491, Mar. 21, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,610

Claims priority, application Japan, Jan. 24, 1978, 53-5816

Int. Cl.³ F02D *15/04*

U.S. Cl. 123—316 **4 Claims**



1. An internal combustion engine with an accumulation chamber, which engine comprises:

a cylinder block having a cylindrical bore formed therein for constituting a part of a combustion chamber in which a piston is reciprocated and a combustible gas mixture is burnt to generate engine power;

a cylinder head secured to said cylinder block, which head has formed therein a recess constituting the other part of said combustion chamber, an intake port for introduction of combustible gas, an exhaust port for removal of exhaust gas, a cavity constituting at least part of an outwardly closed accumulation chamber for temporarily accumulating a part of the combustible gas introduced into said combustion chamber, and a passage between the combustion chamber and the accumulation chamber;

a valve positioned in said passage for controlling communication between said combustion chamber and said accumulation chamber; and

means for opening said valve only once per engine cycle approximately at the time a compression stroke of said piston is commenced and for shutting said valve prior to ignition in the combustion chamber approximately at the time said compression stroke is completed, so that combustible gas under high pressure within said combustion chamber at the completion of said compression stroke is accumulated within said accumulation chamber and that said accumulated combustible gas is spouted into said combustion chamber at the beginning of the next compression stroke; wherein

said accumulation chamber is disposed in a heat exchange relation with exhaust gases of the engine only adjacent to the exhaust port in the cylinder head so that heat from exhaust gases flowing through said exhaust port can be transferred to the accumulated intake gas.

4,442,810

REGULATING DEVICE FOR A FUEL INJECTION PUMP

Franz Eheim, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

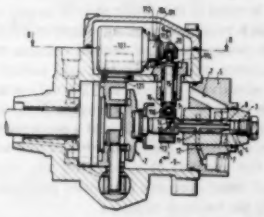
Filed Aug. 18, 1982, Ser. No. 409,249

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1981, 3138640

The portion of the term of this patent subsequent to Mar. 9, 1999, has been disclaimed.

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—357 **10 Claims**



1. In a fuel injection pump for internal combustion engines, including a reciprocating pump piston having conduit means for distributing pumped fuel to respective engine cylinders, and means for precisely regulating the quantity of fuel pumped, during the compression stroke of said piston, to said cylinders, the improvement comprising:

annular means disposed about said piston for selectively blocking said conduits,

electromagnetic means for adjusting the position of said blocking means along said piston means, said adjusting means comprises a linear magnet and

means, coupling said adjusting means to said blocking means, for transmitting motion of said former to said latter,

whereby adjustment of the position of said blocking means

along said piston results in said conduit means being selectively blocked at varying times during said compression stroke thus producing larger or smaller quantities of injected fuel and said blocking means comprises a sleeve slidable axially over the piston.

4,442,811

METHOD AND APPARATUS FOR EXPEDITING THE STARTING OF AN INTERNAL COMBUSTION ENGINE

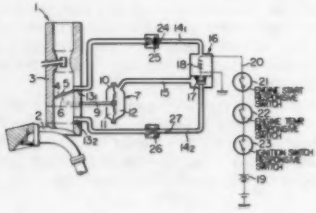
Haruo Shimamura, Kawashima, and Yasuhiro Yamaoka, Niiza, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,195

Claims priority, application Japan, Mar. 31, 1981, 56-45874[U]

Int. Cl.³ F02M *1/10, 19/12*

U.S. Cl. 123—376 **11 Claims**



1. In an internal combustion engine having an intake system with an adjustable throttle valve therein and apparatus for expediting the hot-starting of the engine comprising a vacuum-operated actuator connected to the throttle valve to open the valve to a predetermined throttle position, said actuator having a vacuum chamber connected by a vacuum passage to a port located in the intake system such that suction in the intake system acts on the vacuum chamber to cause the actuator to open the throttle valve during engine operation, the improvement comprising a second vacuum passage extending from a second port located in said intake system to said vacuum chamber, and switch means controlling selective connection of said first vacuum passage and said second vacuum passage to said vacuum chamber of said actuator, said switch means being operable to selectively connect said second vacuum passage to said vacuum chamber when the engine is restarted after the engine has been warmed up and is at a predetermined elevated temperature, and to cut the connection of said second vacuum passage to the vacuum chamber after the engine has been restarted and simultaneously place said first passage into connection with the vacuum chamber.

9. In an internal combustion engine having an intake system with an adjustable throttle valve therein and apparatus for expediting the hot-starting of the engine comprising a vacuum-operated actuator connected to the throttle valve to open the valve to a predetermined throttle position, said actuator having a vacuum chamber connected by a vacuum passage to a port located in the intake system such that suction in the intake system acts on the vacuum chamber to cause the actuator to open the throttle valve during engine operation, the improvement comprising a method including the steps of sensing engine temperature, operating the actuator to open the throttle valve to a more open throttle position than its normal idling position when the engine is restarted after the engine has been warmed up and is at a predetermined elevated temperature and returning the throttle valve to its normal idling position after the hot engine has been restarted.

4,442,812

METHOD AND APPARATUS FOR CONTROLLING INTERNAL COMBUSTION ENGINES

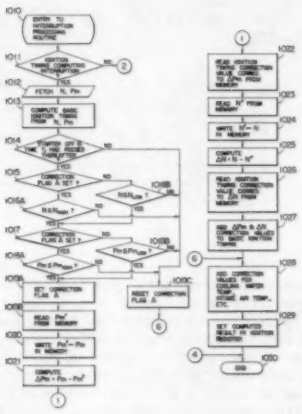
Toshiaki Mizuno, Nagoya, and Mitsunori Takao, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 19, 1981, Ser. No. 322,913

Claims priority, application Japan, Nov. 21, 1980, 55-164230

Int. Cl.³ F02D *5/00, 37/02*

U.S. Cl. 123—417 **14 Claims**



1. A method for controlling an internal combustion engine having an electronically controlled fuel injection system comprising the steps of:

detecting a first operating parameter indicative of engine load and a second operating parameter indicative of engine speed;

computing a basic quantity of a control variable for controlling the operation of said engine in accordance with the detected first and second operating parameters;

determining whether said engine is under any of a plurality of specific operating conditions where correction of the basic quantity of said control variable is inhibited, said plurality of specific operating conditions of said engine including a starting period and a state in which said engine operates in a predetermined range of at least one of said first and second operating parameters;

upon determining that said engine is out of said specific operating conditions:

(1) subtracting a preceding value of said first operating parameter from a present value thereof to obtain a difference $\Delta P_m'$ occurring in a predetermined period, and subtracting a preceding value of said second operating parameter from a present value thereof to obtain a difference $\Delta N'$ occurring in the predetermined period,

(2) computing a correction value of said control variable from the differences $\Delta P_m'$ and $\Delta N'$, and

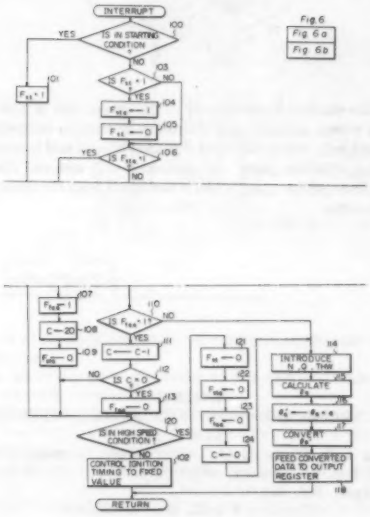
(3) correcting the basic quantity of said control variable by the correction value of said control variable thereby to stabilize the operation of said engine; and

inhibiting the correction of the basic quantity of said control variable upon determining that said engine is under said specific operating conditions.

4,442,813
METHOD OF AND APPARATUS FOR CONTROLLING THE IGNITION TIMING OF AN INTERNAL COMBUSTION ENGINE

Masaomi Nagase, Toyota; Hideo Miyagi, Okazaki; Hironobu Ono, Toyota, and Jiro Nakano, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Sep. 22, 1981, Ser. No. 304,562
Claims priority, application Japan, Sep. 25, 1980, 55-132270
Int. Cl.³ F02P 5/04
U.S. Cl. 123—418 12 Claims



1. A method of controlling the ignition timing of an internal combustion engine, comprising the steps of:

detecting the operating condition of the engine to produce at least one first electrical signal which indicates the detected operating condition;

calculating, in response to the produced first electrical signal, a spark advance angle which corresponds to an optimum ignition timing at the detected operating condition;

detecting whether or not the engine is in a first specific state in which said calculation is difficult to correctly perform, to produce a second electrical signal which indicates that the engine is in the first specific state;

producing an indication of a reference speed related to the coolant temperature of said engine, said reference speed increasing as said coolant temperature is decreasing;

detecting whether or not the engine is in a second specific state where the rotational speed of the engine is greater than said reference speed to produce a third electrical signal which indicates that the engine is in the second specific state;

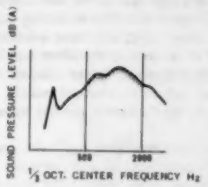
adjusting the timing of the sparks applied to the engine depending upon said calculated spark advance angle; and

in response to said second and third electrical signals, only when the engine is in the first specific state but not in the second specific state, keeping the timing of the sparks applied to the engine at a predetermined fixed timing.

4,442,814
SPARK TIMING CONTROL SYSTEM

Takao Kubozuka, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 13, 1982, Ser. No. 367,925
Claims priority, application Japan, Apr. 15, 1981, 56-54001[U]
Int. Cl.³ F02P 5/04
U.S. Cl. 123—425 13 Claims



1. A spark timing control system for reducing engine noise in an internal combustion engine, comprising:

means for sensing one of engine noise and engine vibration and for generating a sensor output signal corresponding thereto;

means responsive to said sensor output signal for filtering same, said filtering means passing frequency components within a range of 500 to 2,000 Hz;

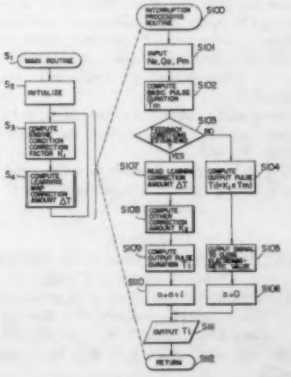
means responsive to said passed frequency components for generating an output signal when the level of said passed frequency components of said filtering means exceeds a reference value; and

means for retarding the spark timing of the engine in response to the output signal of said generating means.

4,442,815
OPTIMUM AIR-FUEL RATIO CONTROL FOR INTERNAL COMBUSTION ENGINE

Masakazu Ninomiya, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 24, 1982, Ser. No. 391,687
Claims priority, application Japan, Jun. 26, 1981, 56-99305
Int. Cl.³ F02D 37/00
U.S. Cl. 123—436 8 Claims



1. A method of controlling air-fuel ratios for an internal combustion engine comprising the steps of:

(i) systematically varying the air-fuel ratio applied to said engine by supplying or not supplying bypass air through a bypass air supply path;

(ii) detecting signals representing the operating conditions of the engine at a plurality of operating points when the engine is operated at different air-fuel ratios produced by said varying step;
(iii) comparing the signals detected at said operating points and deciding whether the air-fuel ratios applied to said engine are rich or lean as compared with the air-fuel ratio associated with the optimum fuel consumption rate;
(iv) discriminating whether the bypass air is supplied or not supplied currently;
(v) changing the value of a correction amount on the basis of the result of the above discriminating step; and
(vi) changing a basic fuel injection amount by said correction amount to produce a modified fuel injection amount, said correction amount being chosen to maintain said modified fuel injection amount nearly constant despite changes in the air-fuel ratio caused by said varying step; and
(vii) correcting said modified fuel injection amount on the basis of said comparing step to optimize the air-fuel ratio for the operating conditions of the engine.

5. An apparatus for controlling the air-fuel ratio applied to an internal combustion engine comprising:
a rotational speed sensor means for detecting the engine rotation speed r;
main air supply means for supplying intake air to said engine;
air flow sensor means for detecting the amount of air p passing through said main air pipe;
bypass air supply means for supplying bypass air to said engine;
air valve means for controlling the supply of bypass air flowing through said bypass air supply means;
fuel injector means for injecting controllable amounts of fuel into said engine; and
computer means for:
computing a basic fuel injection amount T_m in response to outputs of said rotational speed and air flow sensor means;
operating said air valve means to alternate said air-fuel ratio between rich and lean by controlling said air valve means to alternate between the supply and non-supply of bypass air;
discriminating between supply or nonsupply of the bypass air, and changing the value of a first correction amount K_2 on the basis of the result of the discrimination;
changing said basic fuel injection amount by said first correction amount to produce a modified fuel injection amount which remains nearly constant despite change in the air-fuel ratio caused by said air valve means;
detecting the operating condition of said engine at a plurality of predetermined operating points, said operating points including supply and non-supply of bypass air by said air valve means, to obtain a second correction amount T;
correcting said modified injection amount by said second correction amount to obtain an optimum injection amount T_i; and
controlling the amount of fuel injected by said fuel injector means with said optimum injection amount.

4,442,816

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Siegfried Haberland, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

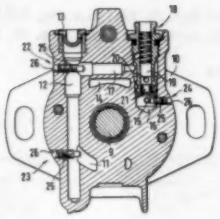
Filed Aug. 23, 1982, Ser. No. 410,667

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138391

Int. Cl.³ F02M *63/00*

U.S. Cl. 123—457 **3 Claims**

1. A fuel injection pump and housing for internal combustion engines having a fuel supply pump, by means of which a suction chamber of said fuel injection pump is supplied with fuel, said chamber being under an rpm-dependent pressure, controllable by means of a pressure control valve having a piston which is acted upon by a pressure to be established, and being displaceable by said latter pressure counter to a restoring spring to thereby control an outflow cross section of an overflow conduit, said overflow conduit conntaining an adjustable throttle restriction, downstream of said throttle restriction said



overflow conduit leads directly to the intake side of said fuel supply pump, wherein said throttling restriction comprises a threaded bolt, which fits into a threaded bore of said housing of said fuel injection pump and protrudes with one end thereof into said overflow conduit and is sealed off from the outside of said housing.

4,442,817

ELECTRONICALLY CONTROLLED FUEL METERING SYSTEM

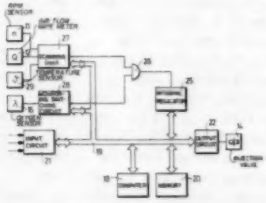
Werner Auth, Stuttgart, and Gunter Felger, Leonberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,376

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124676

Int. Cl.³ F02M *7/00*

U.S. Cl. 123—489 **20 Claims**



1. An electronically controlled fuel metering device for an internal combustion engine having a mixture regulation system comprising
an integrator with a reversible integration direction for controlling said mixture regulation system
switching means connected to said integrator during steady and quasi-steady operational states of the engine,
a λ detection means connected to said switching means, and
said integrator having a time constant which is time-dependent after each occurrence of at least one switchover point of the integration slope thereof in response to said switching means.

4,442,818
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

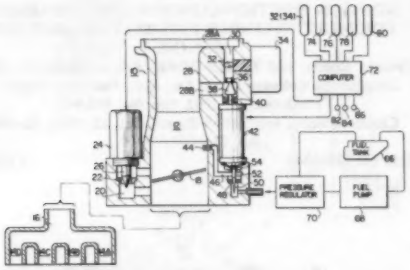
Mineo Kashiwaya, Katsuta; Tohru Nakagawa, Mito; Kinsaku Yamada, Katsuta; Hiroshi Kamifuji, Katsuta; Yoshishige Oyama, Katsuta; Hiroshi Kuroiwa, and Hisato Tsuruta, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,296

Claims priority, application Japan, Dec. 29, 1980, 55-188494; Dec. 29, 1980, 55-188495; Dec. 29, 1980, 55-188496; Dec. 29, 1980, 55-188497; Dec. 29, 1980, 55-188498; Dec. 29, 1980, 55-188499; Dec. 29, 1980, 55-188500; Dec. 29, 1980, 55-188501; Dec. 29, 1980, 55-188502

Int. Cl.³ F02M *7/22*; F02B *33/00*

U.S. Cl. 123—494 **46 Claims**



1. A fuel injection apparatus for internal combustion engine comprising:

an air-intake path connected to the upstream side of an air-intake tube meeting portion;

a Venturi portion formed in said air-intake path;

a throttle valve provided in said air-intake path on the downstream side of said Venturi portion;

an air bypass for connecting the upstream side of said Venturi portion and said Venturi portion;

an air flow meter provided in said air bypass so as to detect the amount of air flow in said air bypass;

an air-scaling valve provided in said air bypass on the downstream side of said air flow meter;

a fuel path through which fuel from a fuel pump is continuously fed into said air-intake path when the internal combustion engine is operating;

a fuel-scaling valve provided in said fuel path;

a drive means for controlling the degree to which said air-scaling valve and said fuel-scaling valve are opened, so that when said air-scaling valve is displaced to decrease the amount of air flow in said air bypass, said fuel-scaling valve is displaced to increase fuel; and

a control signal generating means for applying a control signal to said drive means so that the degree to which said air-scaling valve is opened is controlled for the output of said air flow meter to converge to a certain set level.

4,442,819
HEATER FOR A DIESEL FUEL FILTER

B. R. Veach, Maple Plain, Minn., assignor to Nationwide Carriers Incorporated, Maple Plain, Minn.

Filed May 3, 1982, Ser. No. 374,498

Int. Cl.³ F02M *31/00*

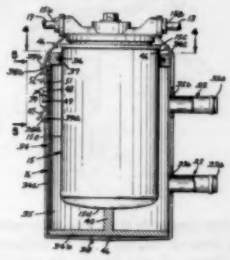
U.S. Cl. 123—557 **14 Claims**

1. In combination with a fuel system in a diesel engine having a liquid coolant system, a heater for heating diesel fuel in a fuel filter, the filter having a sidewall, a top end and a bottom end, said heater comprising:

(a) a receptacle having an open top, said receptacle defining an internal cavity, the bottom end of the fuel filter positioned in said cavity and the top of the fuel filter extending above said receptacle, a portion of the sidewalls of the fuel filter in a spaced relationship to said receptacle;

(b) first means for sealing said receptacle open top, said first means constructed and arranged to cooperatively engage the fuel filter sidewall and closing said receptacle open top;

(c) conduit means for connecting said internal cavity to the coolant system, said conduit means including an inlet conduit and an outlet conduit, said inlet conduit having a first end constructed to be cooperatively connected to and in fluid communication with the liquid coolant system, and a second end cooperatively connected to said receptacle and in fluid communication with said internal cavity, said outlet conduit having a first end constructed to be



cooperatively connected to and in fluid communication with the liquid coolant system, and a second end cooperatively connected to said receptacle and in fluid communication with said internal cavity, whereby heated liquid in the coolant system is passed through said inlet conduit into said internal cavity and adjacent the fuel filter to heat diesel fuel in the fuel filter, said heated liquid exiting said internal cavity through said outlet conduit; and

(d) means, for fastening said receptacle to the fuel filter, said fastening means including a bail member having first and second ends, said bail member extending around said receptacle and across the top end of the fuel filter, and a latch mechanism having a first end cooperatively connected to said first end of said bail member and a second end releasably connected to said second end of said bail member.

4,442,820
EXHAUST RECIRCULATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Toshikazu Ina, Aichi; Hisasi Kawai, Toyohashi; Tokio Kohama, Nishio; Akira Nishimatsu, Okazaki; Yasuhiko Ishida, Mishima, and Souichi Matsusita, Susono, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Sep. 10, 1982, Ser. No. 416,696

Claims priority, application Japan, Sep. 16, 1981, 56-146877; Sep. 16, 1981, 56-146878

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—571 **12 Claims**

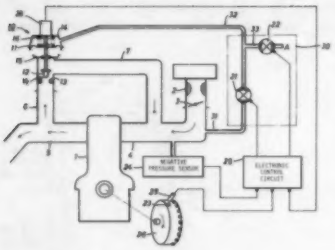
1. An exhaust gas recirculation system for an internal combustion engine having a recirculation passage to provide a communication between an intake pipe and an exhaust pipe of said engine, a pneumatic servomotor to be operated by the pressure applied to its servo-chamber, flow control valve means associated with said servomotor for controlling the quantity of exhaust gas flowing through said recirculation passage in accordance with the level of pneumatic pressure in the servo-chamber of said servomotor, and first and second electrically operated valves to selectively apply negative pressure and the atmospheric pressure respectively from said in-

take pipe and the exterior to the servo-chamber of said servomotor in energization thereof and to maintain the level of pneumatic pressure in the servo-chamber at an adjusted value during deenergization thereof, said recirculation system comprising:

first detecting means for producing a first electric signal indicative of operating conditions of said engine;

second detecting means for producing a second electric signal indicative of the actual opening degree of said flow control valve means;

computer means to calculate a desired opening degree of said flow control valve means in response to said first



electric signal for effecting recirculation of the exhaust gas in a desired quantity in accordance with the operating conditions of said engine, to calculate each energization time of said valves defined by a difference between the actual opening degree of said flow control valve means and the calculated value in response to the second electric signal, and to generate an output signal indicative of the calculated energization time; and

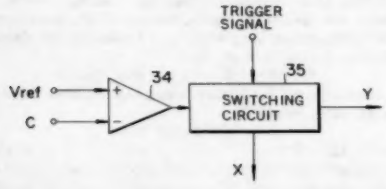
means for selectively energizing said valves in response to the output signal from said computer means for the calculated energization time and for deenergizing both said valves upon lapse of the calculated energization time.

4,442,821

INTERNAL COMBUSTION ENGINE IGNITION METHOD

Kyugo Hamai, Yokosuka; Yasuhiko Nakagawa, Kamakura; Meroji Nakai, Yokosuka, and Ryuzaburo Inoue, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 30, 1981, Ser. No. 335,831
Claims priority, application Japan, Jan. 12, 1981, 56-2190
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—639 **8 Claims**



1. A method of controlling the ignition of an internal combustion engine having at least one combustion chamber, comprising: effecting a plurality of plasma ignitions in said combustion chamber per cycle of said engine during starting of said engine, effecting a single plasma ignition in said combustion chamber per cycle of said engine upon the occurrence of predetermined conditions after starting of said engine and below a predetermined engine speed, and effecting a single normal spark ignition in said combustion chamber per cycle of said engine when the engine is operating above said predetermined engine speed.

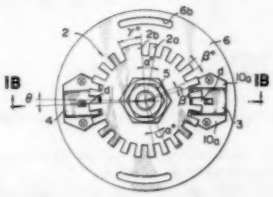
5. An ignition system for an internal combustion engine having at least one plasma ignition plug and at least one normal spark ignition plug, comprising: plasma ignition control means to effect a plurality of plasma ignitions at said plasma ignition plug per engine cycle during the staring of said engine and to effect a single plasma ignition at said plasma ignition plug per engine cycle upon the occurrence of predetermined conditions after starting of said engine and below a predetermined speed of said engine, and normal spark ignition control means to effect normal spark ignition at said normal spark ignition plug when the engine is operating above said predetermined engine speed.

4,442,822

IGNITION POSITION CONTROLLING APPARATUS FOR MULTICYLINDER INTERNAL COMBUSTION ENGINE

Tetsuya Kondo, and Tadashi Nishi, both of Shizuoka, Japan, assignors to Kokusan Denki Co., Ltd., Shizuoka, Japan

Filed Sep. 13, 1982, Ser. No. 416,910
Claims priority, application Japan, Oct. 22, 1981, 56-169031
Int. Cl.³ F02P *5/00*
U.S. Cl. 123—643 **8 Claims**



1. An ignition position controlling apparatus for a multicylinder internal combustion engine which is adapted to apply a microcomputer clock pulses generated every predetermined angle in synchronism with the rotation of the engine and a cylinder discriminating signal generated at a position predetermined with respect to each cylinder during one rotation of the engine and count a predetermined number of clock pulses on the basis of the position at which each of the cylinder discriminating signals is generated, to thereby obtain an angle data necessary to control the ignition position of each cylinder, comprising:

an inductor-type signal generator including a disc-like toothed inductor rotated in synchronism with said engine which has a plurality of first teeth and a single second tooth having a width larger than that of one of said first teeth arranged at regular angular intervals on the periphery thereof and signal generating means of n in number (n being an integer of 2 or more) adapted to induce signals due to the variation in magnetic flux caused by said teeth of said inductor, said signal generating means generating signals of n in number different in phase from each other;

a wave shaping circuit converting said signals of n in number generated from said signal generating means to pulse trains of n in number different in phase from each other and generating said pulse trains;

a clock pulse generating circuit selecting in turn any one of said pulse trains of n in number every 1/n rotation of said inductor and taking out from the selected pulse train pulse signals of a smaller width generated due to the facing of said first teeth with said signal generating means, to thereby generate said clock pulses; and

a cylinder discriminating circuit, when each pulse signal of one of said pulse trains different in phase from each other generated from said wave shaping circuit rises or falls,

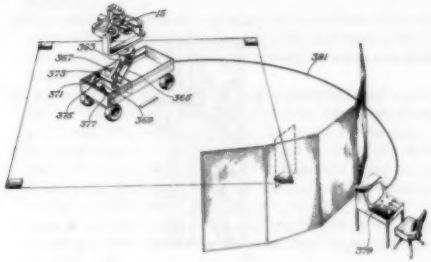
holding the level of pulse signals of the remaining pulse trains, to thereby generate said cylinder discriminating signals.

4,442,823

BALL THROWING MACHINE AND SYSTEM HAVING THREE INDIVIDUALLY CONTROLLABLE WHEEL SPEEDS AND ANGLES

Johnnie E. Floyd, 2609 East Side Dr., Austin, Tex. 78704, and Robert A. Brune, Jr., Austin, Tex., assignors to Johnnie E. Floyd, Austin, Tex.

Filed Mar. 8, 1982, Ser. No. 356,037
Int. Cl.³ F14B *15/00*
U.S. Cl. 124—78 **33 Claims**



1. A ball pitching machine comprising:

a. ball feeding means for feeding respective balls to a feeding point where they will be acted upon by rotating wheel;

b. a plurality of at least three rotatable wheels; said wheels having planes and centers of rotation; said centers of rotation being substantially co-planar and disposed at spaced apart locations in said plane, said wheels and their respective planes of rotation being disposed about said feeding point closely enough to act upon a fed ball and adapted to be oriented at a plurality of individual rifle angles independently of each to effect selectively a plurality of respective spin vectors with respect to a normal trajectory axis equivalent to a straight line of flight of said ball; said wheels having respective location lines from said feeding point to their respective centers of rotation; said location lines being at respective predetermined angles with respect to adjacent said location lines and being disposed so as to define a unique feeding point for said ball and contact said ball on at least three peripheral points;

c. rotation means for rotating respective said wheels at a plurality of individual respective rotational speeds for acting on a fed said ball and effecting a type of spin on the pitched ball, and

d. rifle angle means for orienting each of said wheels independent of the other wheels at a plurality of respective individual said rifle angles with respect to said normal trajectory axis and effecting a rifle spin on said pitched ball;

whereby said ball can be pitched with a spin of about any predetermined axis through a combination of said rotation means and said respective rifle angle means.

4,442,824

ACCESSORY GRILL CONVERTER

Carmine J. Amici, Allentown, Pa., assignor to C.G.J. Inc., Allentown, Pa.

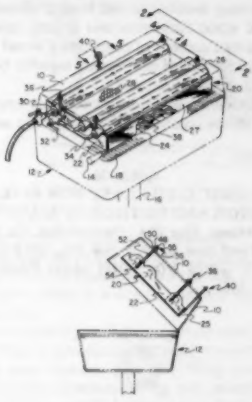
Filed May 6, 1983, Ser. No. 492,463
Int. Cl.³ F24C *3/00*
U.S. Cl. 126—14 **11 Claims**

1. A top grill converter for a conventional outdoor electric or gas-fired grill comprising:

(a) a generally parallelpipedal cartridge having a foraminous floor;

(b) a back wall, front wall and side walls attached along bases of said walls to said foraminous floor, said walls being of a sufficient height to provide containment for heat transferring bricks intended to rest on said foraminous floor;

(c) a roof-forming, undulated heat shield attached to said walls along the uppermost edges of said walls, said undulations paralleling the longitudinal axis of said cartridge,



and said undualted heat shield's troughs being located proximate the top of said walls, and said undulated heat shield's peaks providing space and protection for heating elements;

(d) heating elements located longitudinally inside said parallelpipedal cartridge under said heat shield in spaces created by said undulated heat shield's peaks, one end each of said heating elements attached to an exterior heat source; and,

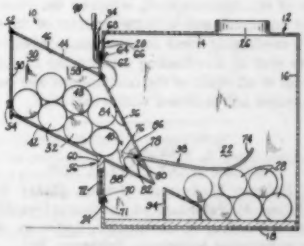
(e) means for suspending said cartridge beneath and inside a lid of said conventional outdoor grill.

4,442,825

FUEL FEEDER DEVICE FOR SPACE HEATING STOVES

Geoffrey Waldau, 1570 Mt. Eagle Pl., Alexandria, Va. 22302

Continuation of Ser. No. 114,121, Jan. 21, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,177
Int. Cl.³ F24B *7/00, 13/04*
U.S. Cl. 126—68 **34 Claims**



1. A fuel feeder device for wood-burning stoves comprising: a fuel storage chamber having first and second end portions, means for detachably mounting said storage chamber adjacent a wood stove so that said first end portion is aligned

with the combustion chamber door opening of a wood stove,

a door pivotally mounted adjacent said first end of said storage chamber,

an elongated sensing member having first and second end portions with said first end portion adapted to extend into the combustion chamber of a wood stove to lie atop combusting fuel to sense the height thereof and said second end portion pivotally mounted adjacent said first end portion of said storage chamber,

a catch means releasably connecting said second end portion of said sensing member to said storage chamber to release additional wood fuel upon said sensing means sensing a predetermined amount of combusting wood fuel with said second end portion of said sensing member being pivotally connected to said door, and

means for delivering additional wood fuel from said storage chamber to the combustion chamber of a wood stove.

4,442,826

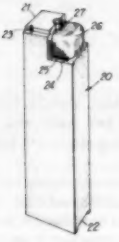
PREFABRICATED PANEL FOR BUILDING CONSTRUCTION AND METHOD OF MANUFACTURING

Frank M. Pleasants, Star Rte., Dawsonville, Ga. 30534

Filed Nov. 4, 1980, Ser. No. 203,910

Int. Cl.³ F24H *7/00*; E04H *14/00*; F24D *5/10*

U.S. Cl. 126—400 **3 Claims**



1. A rigid unitary substantially rectangular structural panel of a size suitable for spanning at least vertically a substantial portion of a building wall, said structural panel comprising a non-rigid thin wall collapsible plastics material containment adapted to hold a thermal fluid, said containment having a neck of substantially reduced size at one end thereof, the containment being otherwise closed and being fluid impermeable and resistant to corrosion, a thin shell of concrete cast onto and completely surrounding and enclosing the containment and externally supporting the walls of the containment, said neck of the containment being embedded in one end wall of the concrete shell and the neck having a mouth opening through the exterior of the concrete shell, whereby the interior of the containment communicates with the exterior of the structural panel, and a reinforcing mesh for the panel embedded within the concrete shell in surrounding relationship to the containment adjacent to all walls of the containment and being completely concealed and enclosed within said shell.

4,442,827

SOLAR HEAT COLLECTOR

Edward R. Helman; Herbert A. Helman; Henry B. Holtschneider; Sidney P. Buford, all of Baltimore; Donald C. Fava, Timonium, and Jeffrey N. Christopher, Baltimore, all of Md., assignors to Supreme Associates, Baltimore, Md.

Filed Oct. 8, 1981, Ser. No. 309,752

Int. Cl.³ F24J *3/02*

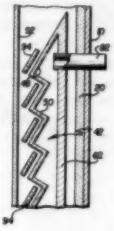
U.S. Cl. 126—430 **12 Claims**

1. An improved solar heat collector, comprising:

a housing having a front for facing the sun, a back for facing adjacent support structure and peripheral walls extending between said front and back;

at least one heat absorber element positioned within said housing, said absorber element having a first front surface for facing the sun, said first front surface having a low thermal emittance and a high solar absorptance, said absorber element also having a first rear surface for facing away from the sun, said first rear surface having a high thermal emittance and a low solar absorptance;

at least one heat storage element positioned within said housing and spaced from said first rear surface to define a volume therebetween, said storage element having a second front surface facing toward said first rear surface, said second front surface having, like said first rear surface, a high thermal emittance and a low solar absorptance, said



storage element also having a second rear surface for facing away from the sun, said second rear surface having, like said first front surface, a low thermal emittance and a high solar absorptance;

means for closing said volume between said first rear surface and said second front surface to define a heat transfer cavity into which heat transfer is maximized from both said absorber element and said storage element but from which heat loss is minimized to both said absorber element and said storage element, as a result of the differences in thermal emittance and solar absorptance between said first front and rear surfaces and said second front and rear surfaces, respectively; and

means for directing a flow of air through said cavity, whereby said air is heated.

4,442,828

PORTABLE TYPE SOLAR HEAT COOKER ASSEMBLY

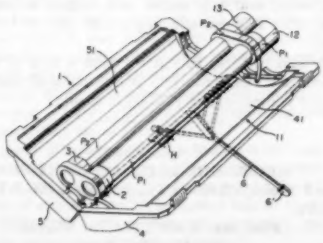
Hirosato Takeuchi, and Toshio Mikiya, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1984, Ser. No. 439,608

Claims priority, application Japan, Nov. 6, 1981, 56-177077

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—451 **4 Claims**



1. A portable type solar heat cooker assembly including a cooking glass tube comprising:

an inner tube being constructed of glass having a closed bottom and an open end;

a selective absorption film having a high absorptivity in the solar radiation spectrum zone and a low absorptivity in the heat radiation spectrum zone being coated on an outer surface of said inner tube;

an outer tube being constructed of glass having a closed bottom and an open end and having a predetermined diameter for permitting said inner tube to be coaxially inserted therein;

a spacer being positioned on said inner tube for maintaining the coaxial spaced relationship between said inner and outer tubes;

said inner and outer tubes being hermetically sealed together at their open ends with said space therebetween being evacuated;

a lid removably positioned on said open end of said inner and outer tubes for permitting insertion of a substance into said inner tube to be cooked and for closing the open end of the inner tube;

a case having a predetermined length and width and a cover hinged thereto, said cooking glass tube being operatively positioned and extending along the length of the case;

said cover being a single element hinged to one of the width sides of said case and said cooking glass tube being hinged to said case and said cover for automatic movement to a central position when said cover is opened;

a curved reflector symmetrically positioned in said case forming a reflex mirror for the solar rays when said case is opened; and

a collapsible stand attached to an outer surface of said case for adjustably positioning said case in an inclined state.

4,442,829

MATERIAL FOR SELECTIVE ABSORPTION OF SOLAR ENERGY AND PRODUCTION THEREOF

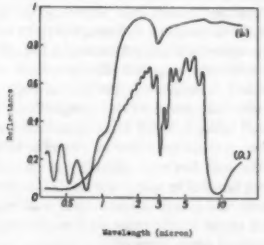
Kiyomi Yanagida, Suita; Tadashi Hirokane, Nagoya; Tadashi Tsukiyasu, Nagoya, and Tomoari Sato, Nagoya, all of Japan, assignors to Sumitomo Aluminium Smelting Company, Ltd., Osaka, Japan

Filed Jun. 13, 1978, Ser. No. 915,299

Claims priority, application Japan, Jun. 14, 1977, 52-70737

Int. Cl.³ F24J 3/02; C25D 11/22

U.S. Cl. 126—452 **10 Claims**



1. In a method for selectively absorbing solar energy with an aluminum material having a porous anodic oxide film thereon and metal particles electrochemically filled in the micropores of the anodic film by exposing the said aluminum material to solar energy to absorb said energy, the improvement which comprises using, as the aluminum material, aluminum having a purity of 99.92% by weight or more as a substrate and having a porous anodic oxide film of 1μ or less in thickness formed on the surface of the substrate, which film has metallic particles electrochemically filled in the micropores of the anodic film, said improved material having infrared solar energy absorbing characteristics in the visible and near infrared range, and lowered radiation of the absorbed thermal energy in the infrared range.

4,442,830

MOUTH DOUCHE

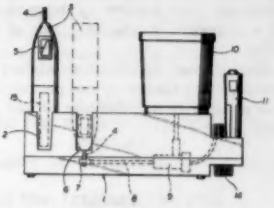
Dieter Markau, Murten, Switzerland, assignor to Gimelli + Co. AG, Zollikofen, Switzerland

Filed Sep. 29, 1982, Ser. No. 427,317

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206843

Int. Cl.³ A61H 9/00

U.S. Cl. 128—66 **9 Claims**



1. A device for oral hygiene, comprising:

a mouth douche including a base provided with a water reservoir, a nozzle insertable into the oral cavity of a user, and a water pump in a conduit linking said nozzle with said reservoir;

a toothbrush assembly including a power unit having a drive shaft having means for operatively connecting a bristle-carrying head thereto, said base being provided with a seat removably accommodating said assembly, said base further having a socket having means for receiving a part of said drive shaft; and

coupling means in said base engageable with said drive shaft upon insertion of said part thereof into said socket for operatively linking said power unit with said water pump to actuate the latter, said drive shaft being decoupled from said water pump upon removal of said assembly from said base to facilitate the use of said assembly for tooth brushing.

4,442,831

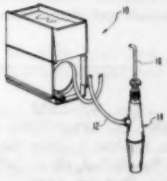
ON/OFF HANDLE FOR ORAL HYGIENE APPARATUS

John M. Trenary, Fort Collins, Colo., assignor to Teledyne Industries, Inc.

Filed Sep. 30, 1982, Ser. No. 428,904

Int. Cl.³ A61H 9/00

U.S. Cl. 128—66 **6 Claims**



1. Oral hygiene apparatus comprising:

means for producing a succession of water pulses at a preselected pressure;

a handle shaped to be grasped by the human hand;

means for delivering said water pulses from said producing means into said handle;

an elongated nozzle projecting outwardly from said handle, manipulation of said handle permitting said water pulses, flowing through said nozzle from said handle, to be directed against the teeth and gums of the user;

means included within said handle to define a flow path from said delivering means into said nozzle;

storage means disposed to communicate with said flow path and accumulate pressure in said water pulses;

a valve member disposed in said flow path within said handle and movable between a first position, in which said flow path to said nozzle is opened and communication of said flow path with said storage means is closed, and a second position in which said flow path to said nozzle is closed and communication of said flow path with said storage means is open;

means included in said valve member and said handle for biasing said valve member by the pressure in said water pulses to remain in whichever one of said positions it resides;

and actuating means disposed in association with said handle for overcoming the bias by said pressure and moving said valve member from either one of said positions to the other.

4,442,832

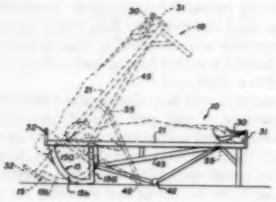
THERAPEUTIC COUCH

Eugene Ollenberger, 4305 Francis St., Burnaby, British Columbia, Canada V5C 2R2

Filed Nov. 28, 1980, Ser. No. 210,894

Int. Cl.³ A61F 5/00

U.S. Cl. 128—71 **7 Claims**



1. A therapeutic couch comprising a frame having opposite ends, legs at the opposite ends normally supporting the frame in the horizontal position above a floor, the legs at one end including rocker portions normally having rolling contact with the floor, a bench mounted on the frame to accomodate a person in the prone position, a lever assembly on the underside of the frame, and operating means on the frame for moving the lever assembly relative to the frame and the floor so as to upend the frame on the lever assembly and the rocker portions of the legs at the one end of the frame, to a selected tilted position.

4,442,833

CASTING OR SPLINTING PACKAGE

Burton L. Dahlen, Benicia; L. John Odne, Walnut Creet, and John D. Ryan, San Rafael, all of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Mar. 27, 1981, Ser. No. 248,610

Int. Cl.³ A61F 5/04

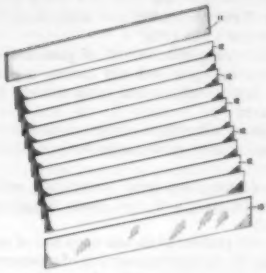
U.S. Cl. 128—90 **16 Claims**

1. A casting or splinting package for immersion in water and contact with and formation about a body part comprising -

a first sheet of resilient, closed cell foam material,

a plurality of second sheets comprising a textile substrate impregnated or coated with a water-curable resin system,

a third sheet of a flexible material disposed in overlying relationship to said first sheet and said second sheets to non-sealably confine said second sheets between said first sheet and said third sheet, the third sheet being substantially unable to absorb an amount of water greater than that absorbed from air after desiccation, and



a porous envelope wherein said first, second and third sheets are enclosed.

4,442,834

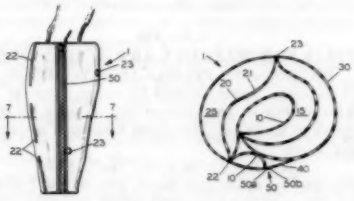
PNEUMATIC SPLINT

Kevin M. Tucker, and Terry L. Sandman, both of Toledo, Ohio, assignors to Jobst Institute, Inc., Toledo, Ohio

Filed Oct. 2, 1981, Ser. No. 307,658

Int. Cl.³ A61F 5/04

U.S. Cl. 128—90 **5 Claims**



1. A pneumatic splint comprising an inner wall, an intermediate wall, and an outer wall, each of said walls being formed of thermoplastic sheet material and adapted to be rolled into an annular configuration to loosely surround a human limb; both peripheral edges and one longitudinal edge of said intermediate wall being bonded to respective peripheral and longitudinal edges of said outer wall and a second longitudinal edge of said intermediate wall being bonded to an intermediate portion of said outer wall so as to define a first air chamber therebetween; said intermediate wall having a plurality of spaced apertures therein and being bonded to said outer wall at localized regions spaced apart from said apertures; said outer wall being substantially identical in shape to said inner wall and having its peripheral and longitudinal edges respectively bonded to the peripheral and longitudinal edges of said inner wall to define a second air chamber between said inner and intermediate walls; one peripheral end portion of the inner surface of said outer wall lying in overlapped abutting relation to a peripheral end portion of the outer surface of the inner wall when said walls are rolled into said annular configuration; means on said outer wall for supplying and maintaining pressured air in said second chamber so as to maintain said inner wall in spaced apart relation to said intermediate wall such that a substantially uniform pressure is applied against the human limb when inflated; and fastening means on said overlapped abutting peripheral end portions of said outer wall and said inner wall for detachably securing said end portions in overlapped relation when said walls are rolled into said annular configuration.

4,442,835

DEEP DIVING BREATHING SYSTEMS

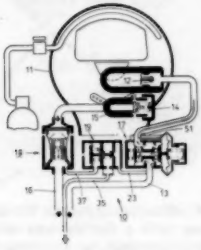
Alistair L. Carnegie, Yeovil, England, assignor to Normalair-Garrett (Holdings) Limited, Yeovil, England

Filed Dec. 3, 1981, Ser. No. 327,084

Claims priority, application United Kingdom, Dec. 4, 1980, 8038977

Int. Cl.³ A62B 7/00

U.S. Cl. 128—201.27 9 Claims



9. Deep diving apparatus including a diving bell, at least one diving suit having a diving helmet, a breathing system, comprising push-pull pump means located on the diving bell for supplying breathable gas mixture by way of a gas supply line to the helmet of a diver operating out of the bell and for returning gas from the helmet to the bell by way of a gas return line, and helmet pressure control means mounted adjacent to the helmet having inlet valve means for controlling the rate of flow of breathable gas from the gas supply line to the helmet, outlet valve means for controlling flow of gas from the helmet to the gas return line, bleed valve means and a bleed gas return line connected between said bleed valve means and said diving bell, said bleed valve means operable in response to the difference in pressure of gas flowing from the outlet valve means and the hydrostatic pressure ambient to the bleed valve means for bleeding gas from the gas supply line upstream of the inlet valve means to said bleed gas return line.

4,442,836

BLOOD LANCET DEVICE

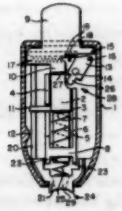
Dieter Meinecke; Werner Schmidt, both of Mannheim; Rudolf Schüssler, Lampertheim, and Rainer van Rijckevorsel, Brühl, all of Fed. Rep. of Germany, assignors to Clinicon Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Mar. 18, 1981, Ser. No. 245,010

Claims priority, application European Pat. Off., Mar. 22, 1980, 3011211; Fed. Rep. of Germany, Nov. 15, 1980, 80107078

Int. Cl.³ A61B 17/34

U.S. Cl. 128—314 13 Claims



1. A blood lancet device comprising: a housing having a lancet exit opening; means receptive of a lancet for guiding same in the housing for movement between a retracted position and a puncturing position wherein the lancet projects from the exit opening; means for releasably spring loading the lancet into the retracted position for impulse-like movement into the puncturing position upon release with immediate return movement towards the retracted position, the releasable spring loading means comprising a movable stop membber for retaining the lancet in the retracted position, two springs, the first spring for applying a force to move the lancet towards the puncturing position and the second spring for applying a force to immediately thereafter move the lancet towards the retracted position and means for transmitting the force of the first spring to the lancet and for discontinuing the application of the force by the first spring during the movement of the lancet towards the puncturing position; and triggering means for moving the stop member to enable movement from the retracted position to the puncturing position.

4,442,837

TWEEZERS FOR THE REMOVAL OF PARASITES FROM ANIMALS

Lawrence A. Keatley, 553 N. Harrison St., Fort Bragg, Calif. 95437

Filed Mar. 1, 1982, Ser. No. 353,372

Int. Cl.³ A01M 3/00

U.S. Cl. 128—354 3 Claims

1. Tweezers for the removal of parasites from animals comprising:

a pair of flexible legs fixedly joined at their upper ends;

inwardly directed gripping portions on the distal ends of said legs; and

said gripping portions being normally separated but being engageable by squeezing said legs to flex them toward each other;

camming surfaces on the outside of said legs intermediate the ends thereof;

said camming surfaces including:

generally parallel open-leg, flat surfaces formed inward from the lateral surfaces of said legs toward the distal ends thereof;

generally parallel, closed-leg, flat lock surfaces near the lateral surfaces of said legs toward the joint between them; and

intermediate actuating surfaces diverging upward from said open-leg surface to said close-leg lock surfaces;

said tweezers further including:

a lock slide embracing said legs to slidably engage over said camming surfaces so that when raised from said open-leg surfaces it flexes said legs together and holds said gripping portions together when at said closed-leg lock surfaces;

a thumb ring secured to the joint between said legs;

a lateral extension on said lock slide the underside of which is engagable by a person's finger on one hand while the thumb of the same hand is positioned in said thumb ring thereby to raise said lock slide; and

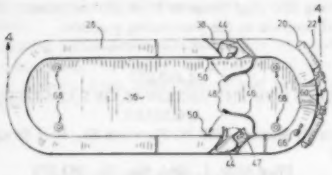
a knob fixed to the top of said thumb ring to be engaged by the thumb and a finger of said same hand while said lock slide is at said closed-leg lock surfaces to turn said legs about a longitudinal axis extending between them.

4,442,838

MALIGNANT HYPERTHERMIA MATTRESS

J. E. Benoit Samson, Nepean; Lawrence W. Duncan, Munster Hamlet, and Jean C. Steffler, Downsview, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Mar. 25, 1982, Ser. No. 361,606
Claims priority, application Canada, Apr. 1, 1981, 374428
Int. Cl.³ A47G 7/00; A47C 27/10; A61H 33/00; A61F 7/00
U.S. Cl. 128—369 17 Claims



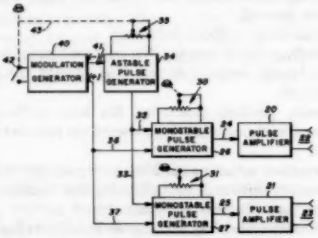
1. A mattress adapted to overlie an operating table for use in the treatment of malignant hyperthermia, comprising a base having a peripheral edge, an inflatable wall extending around said peripheral edge and having an upper portion delimiting said wall and a lower portion operatively connected to said base, said wall including a pair of recesses positioned in opposed areas of said wall and extending from said upper portion toward said lower portion, to accommodate the arms of a patient lying on said mattress, flexible flap means extending across each of said recesses, and inflation means associated with said wall to inflate said wall from a generally deflated condition in which said upper edge lies adjacent said base to an inflated condition in which said wall is upstanding.

4,442,839

METHOD OF MODULATING ENERGY IN TRAIN OF ELECTRICAL PULSES

Donald D. Maurer; David E. Swift, both of Anoka, and Zosim Ioffe, St. Paul, all of Minn., assignors to EMPI, Inc., Fridley, Minn.

Filed Apr. 27, 1981, Ser. No. 257,737
Int. Cl.³ A61N 1/36
U.S. Cl. 128—419 R 8 Claims



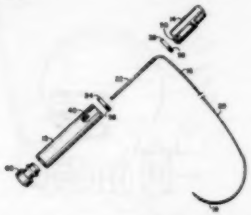
1. A method of controlling the average energy in a train of electrical pulses comprising: supplying a train of electrical pulses, selectively increasing and decreasing the repetition rate of said electrical pulses, counteracting the energy increase associated with an increase in repetition rate of the electrical pulses by simultaneously decreasing the width and amplitude of the electrical pulses and modulating the pulse rate range to reduce the average energy in said train of electrical pulses, and counteracting the energy decrease associated with a decrease in repetition rate of the electrical pulses by simultaneously modulating the pulse rate range and increasing the width and amplitude of the electrical pulses.

4,442,840

ELECTRICAL CONNECTOR APPARATUS AND METHOD FOR A TEMPORARY CARDIAC PACING WIRE

Alexander Wojciechowicz, Jr., 7 Herrontown Rd., Princeton, N.J. 08540

Filed Jun. 7, 1982, Ser. No. 385,931
Int. Cl.³ A61N 1/104
U.S. Cl. 128—419 P 10 Claims



1. An electrical connector apparatus for connecting a rigid male electrical lead with a flexible wire attached thereto to medical electronic instruments, said apparatus comprising:

a non-conductive connector body having a closed end and an open end having an interior cavity therein, said closed end having an aperture therethrough extending from the outside of said connector body into said interior cavity, said aperture being of sufficient size to receive said rigid male electrical lead therein, said non-conductive connector body including indent means thereon;

a cap means receivable on said closed end of said connector body for holding said rigid male electrical lead in said aperture and for securing said flexible wire lead to said rigid male electrical lead in an orientation that is substantially perpendicular to said rigid male electrical lead; and,

cap locking means for locking said cap means to said connector body, said cap locking means comprising a bifurcated spring-action means including:

at least two resilient arm means attached to said cap means at one end; and,

tab means attached to said resilient arm means and oriented to be received in said indent means in said connector body,

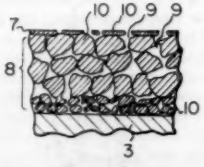
wherein said cap means positively locks said rigid male electrical lead in said non-conductive connector body.

4,442,841

ELECTRODE FOR LIVING BODIES

Masaru Uehara, Komaki; Teruyoshi Uchida, Nagoya, and Hirotaka Kojima, Kasugai, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 259,112
Int. Cl.³ A61B 5/00
U.S. Cl. 128—635 6 Claims



1. A fine wire electrode for measuring gas concentration in living bodies comprising an electrically conductive metal, a high molecular porous membrane of a thickness ranging from 10 to 200 μm directly coated on at least a portion of a surface of said electrically conductive metal, said membrane comprising a surface layer having fine pores of an average pore diameter greater 0.01 μm and smaller than 0.7 μm and an inner layer which is contiguous with the surface layer having pores of an average diameter greater than that of the surface layer, and an

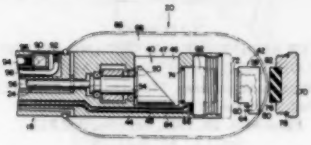
insulating material sheathing the remaining surface of said conductive metal.

4,442,842

ULTRASONIC SCANNER FOR EXAMINATION OF A COELIAC CAVITY

Kazuo Baba, 1079, Kitano-machi, Hachioji-shi, Tokyo, Japan

Filed Nov. 3, 1980, Ser. No. 203,511
Claims priority, application Japan, Nov. 12, 1979, 54-146240
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **12 Claims**



1. In an endoscope apparatus, an ultrasonic scanner for internal examination, comprising:

a flexible endoscope insertion body which is sized for introduction into a cavity of a living body such as a human body and having an end;

ultrasonic beam-scanning means, provided at said end of said insertion body to be introduced into said body cavity, and including scanning means for scanning a selected region of said body cavity with ultrasonic beams and guiding reflected echoes of said ultrasonic beams in a predetermined direction with respect to said insertion body, said beam-scanning means including a casing member carrying said scanning means having a transducer-receiving hollow receptacle at an end portion thereof and in the path of said guided reflected echoes, said transducer-receiving receptacle having an opening for receiving a transducer therein, said scanning means and said transducer-receiving receptacle being arranged adjacent each other in the axial direction of said endoscope insertion body;

ultrasonic transducer means mounted in said transducer-receiving receptacle of said casing member and having a predetermined conversion property, for (i) converting into an ultrasonic beam to be supplied to said beam-scanning means a high frequency electrical pulse which is transmitted to said transducer means through said insertion body and said casing member in accordance with said predetermined conversion property and (ii) converting said reflected echoes into a corresponding electrical signal for transmission to an external component through said casing member and said insertion body in accordance with said predetermined property, said transducer means being removably disposed in said transducer-receiving receptacle of said casing member, whereby said transducer means may be replaced with another transducer means having a different property, when so desired;

said casing member comprising a cap removably closing said opening of said transducer-receiving receptacle to retain a transducer means in said receptacle; and

an elastic element interposed between said cap and a transducer means received in said transducer-receiving receptacle to elastically press said transducer means into said receptacle.

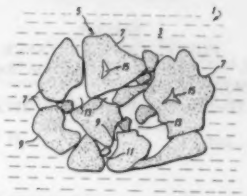
4,442,843

MICROBUBBLE PRECURSORS AND METHODS FOR THEIR PRODUCTION AND USE

Julia S. Rasor, Cupertino, and Ernest G. Tickner, Gilroy, both of Calif., assignors to Schering, AG, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 207,741, Nov. 17, 1980, abandoned. This application Nov. 17, 1981, Ser. No. 322,138
Int. Cl.³ A61G *10/00*
U.S. Cl. 128—660 **17 Claims**

1. In a method for altering the transmission characteristics of a liquid to an electromagnetic or elastic wave transmitted therethrough by dispersing in the liquid an amount of microbubbles effective to substantially alter such transmission characteristics of the liquid in the area thereof containing the microbubbles, the improvement wherein the microbubbles are formed by dissolving in the liquid a solid which is particulate, is substantially free of microbubbles, and consists predominantly of particles which have a plurality of gas-filled voids communicating with the surface of the particles and a plurality of nuclei for microbubble formation and the ratio of the mass of the particles to the volume of gas in the voids is sufficient to render the liquid in which the particulate material is dissolved supersaturated with respect to the gas in the voids in the area of the liquid surrounding the microbubbles.

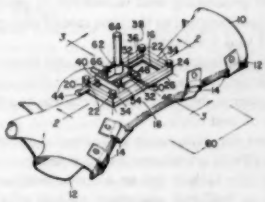


4,442,844

METHOD AND APPARATUS FOR MAKING PHYSIOLOGICAL MEASUREMENTS

Joseph H. Navach, 17240 Halsted St., Northridge, Calif. 91325

Filed Aug. 28, 1981, Ser. No. 297,513
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—663 **25 Claims**



1. An apparatus for use in making measurements on a living body having an arteriovascular circulatory system which comprises:

a support means for engaging a part of the body adjacent to a location in the body where a length of any artery extends substantially linearly and is adjacent to and generally parallel with the surface of the skin so as to substantially immobilize said part without interfering with the circulation of blood within said artery, said support means being shaped so as to include an opening means adjacent to said length of said artery,

a radiation source means and a radiation detection means for use in making measurements by sending out radiation from said source means and by measuring radiation reaching said detection means,

holder means for holding said radiation source and detection means located in a location adjacent to said opening means, said holder means supporting said radiation source and detection means adjacent to said opening means,

positioning means for moving said holder means and said radiation source and detection means relative to said support means in a coordinate system into any of a series of locations along said length of said artery which have been established as normally being capable of transmitting at least some radiation in an amount having physiological significance from a radiation source, said positioning means being held on said said support means,

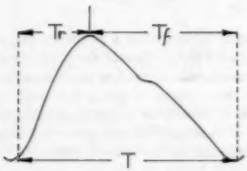
said holder means and said positioning means serving to hold both said radiation source means and radiation detection means at a specific measurement location so that as said apparatus is used at such a location some radiation from said radiation source means will traverse a part of said body and will be detected by said radiation detection means.

4,442,845

PULSE CURVE ANALYSER

Frederick R. N. Stephens, 67 Coolawin Rd., Northbridge, N.S.W., 2063, Australia

Filed Nov. 10, 1981, Ser. No. 319,963
Int. Cl.[3] A61B 5/02
U.S. Cl. 128—687 4 Claims



1. A pulse curve analyser comprising, in combination, light-responsive transducer means for sensing a patient's continuous physiological circulatory activity by responding to light modulated by changes in capillary blood micro-circulation and producing a voltage waveform which is an analog of said patient's body tissue pulsatile blood color and/or density changes,

means for processing said waveform to produce an output signal proportional to the time rate of change of the amplitude of said waveform, and

means for displaying quantitatively and instantaneously data representing at least one of the rise time and the fall time of a transient cycle of said waveform as a function of the period of said cycle,

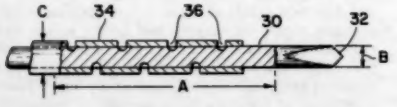
said means for processing including a circuit wherein the output of said transducer means is fed to a notch filter, the output of which is fed to a operational amplifier whose output is buffered and then passed to a differentiator which in turn feeds a low pass filter having linear phase, the latter being offset whereby its output voltage is negative when said voltage waveform is rising, and positive when said voltage waveform is falling, and has a magnitude which is proportional to both the amplitude of said voltage waveform and its time rate of change.

4,442,846

DISTRIBUTED PORT BONE-PIERCING CATHODE FOR ELECTRICALLY STIMULATED OSTEOGENESIS

Carl T. Brighton, Malvern, and Jonathan Black, King of Prussia, both of Pa., assignors to University of Pennsylvania, Philadelphia, Pa.

Filed Nov. 10, 1981, Ser. No. 320,110
Int. Cl.[3] A61N 1/04
U.S. Cl. 128—784 8 Claims



1. A cathode for use in stimulating osteogenesis in the vicinity of a human fracture site when connected to a suitable current source, said cathode comprising:

a biocompatible conductor means for drilling through bony tissue layers having at least one end; and

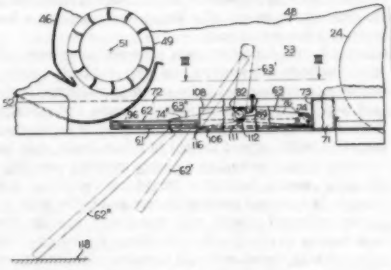
biocompatible non-conducting means for insulating said conductor means, said insulating means generally covering said conductor means except in the vicinity of said at least one end, said insulating means further including means for defining at least one port in said insulating means exposing a portion of the surface of said conductor means.

4,442,847

HARVESTER AIR INTAKE SCREEN AND ACCESS DOOR WITH OPENING AND CLOSING MECHANISM

Robert T. Buck, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Mar. 29, 1982, Ser. No. 362,832
Int. Cl.[3] A01F 12/48
U.S. Cl. 130—27 Z 9 Claims



1. In a harvester having a main frame supported at its rear end by a pair of steerable wheels and at its front end by a pair of drive wheels, an engine, a power train including a change speed transmission between the engine and the drive wheels, an elevated crop processor, a header, means conveying crop material from the header to the crop processor including an upwardly and rearwardly extending conveyor with a housing, a pair of verical side walls, a fan between said side walls and a duct extending upwardly from said fan, said side walls, fan, duct and conveyor housing defining an interior cavity from which a person has servicing access to said fan, conveyor and transmission, a combined air inlet screen and access door arrangement characterized by

a screen door assembly at the bottom of said cavity including a transverse screen having a horizontal closed position,

crank arm means including a pair of crank arms at laterally opposite sides of said screen having first corresponding ends pivotally connected to said screen on a first horizontal transverse pivot axis and second corresponding ends pivotally mounted on said main frame on a second horizontal transverse pivot axis by pivot means including a shaft part rigidly secured to one of said crank arms in coaxial relation to said second transverse axis and operable to rotate said one crank arm about said transverse axis, and

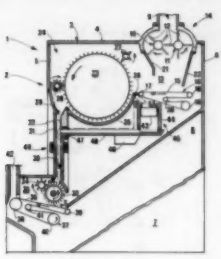
abutment means on said main frame and screen assembly engagable to limit rotation of said crank arm means in one direction about said second axis wherein said screen is in its horizontal closed position, said crank arm means being rotatable by rotation of said shaft part from a first position in which said screen is in a horizontal closed position to a second position in which said screen is shifted to an open position exposing a doorway at the bottom of said cavity through which a serviceperson may enter the cavity.

4,442,848

CIGARETTE-MAKING MACHINE

Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa' per Azioni, Bologna, Italy

Filed Feb. 2, 1982, Ser. No. 345,038
Claims priority, application Italy, Feb. 23, 1981, 47873 A/81
Int. Cl.³ A24C 5/39
U.S. Cl. 131—108 5 Claims



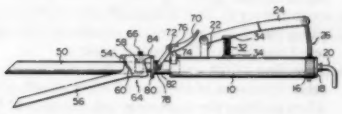
1. A cigarette making machine comprising a main tobacco supply unit (24), a shaft (30) extending downwards from a bottom portion of said main tobacco supply unit (24), and an auxiliary supply unit (45) communicating with an intermediate portion of said shaft (30), said auxiliary supply unit (45) comprising at least two tobacco conveying means (46) independent of one another and extending alongside one another in a major transverse direction of said shaft (30), and tobacco-flow control means (49) associated with each said conveying means (46) and sensitive to the level of tobacco within said shaft (30).

4,442,849

CURLING IRON

Shinichi Kawabe, Fukuoka, Japan, assignor to Idea Giken Ltd., Fukuoka, Japan

Filed Dec. 3, 1981, Ser. No. 326,860
Claims priority, application Japan, Dec. 9, 1980, 55-174296; Dec. 26, 1980, 55-188008; Mar. 3, 1981, 56-30672
Int. Cl.³ A45D 2/12
U.S. Cl. 132—37 R 27 Claims



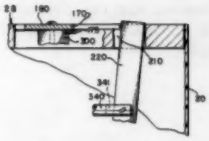
1. A curling iron comprising:
a handle;
an iron rod having a shaft mounted rotatably within said handle;
a clamping member pivoted to said iron rod for opening and closing movement with respect thereto for clamping a lock of hair against said iron rod;
means associated with said clamping member for opening and closing said clamping member;
means for rotating said shaft to twine the lock of hair to be curled around said iron rod;
means being provided between said iron rod and said clamping member for biasing the clamping member towards the normally open position, said means for moving the clamping member comprising a slide sleeve mounted axially slidably around said rotatable shaft between said clamping member and said handle, said slide sleeve having a flange at the end adjacent to said clamping member;
an actuating lever pivoted at its middle to said handle and having at its lower end a roller engageable with said flange; and
at least one prong provided at an end of the clamping member in such a manner that engagement with said flange to move said slide sleeve lengthwise toward said clamping member, said flange pushes the prong to close the clamping member.

4,442,850

COIN COUNTER

Warren Austin, and Alex Penny, both of West Chester, Pa., assignors to Accurate Counters Company, West Chester, Pa.

Filed Feb. 26, 1982, Ser. No. 352,699
Int. Cl.³ G07D 3/12
U.S. Cl. 133—3 H 8 Claims



1. A coin counter comprising:
a housing;
coin inlet means for receiving coins to be counted;
coin outlet means for discharging counted coins;
means defining a coin passageway through said housing from said coin inlet means to said coin outlet means;
conveyor means for advancing coins successively through said coin passageway from said coin inlet means to said coin outlet means;
gate means and separator means disposed in said coin passageway enabling the conveyance of coins of a selected thickness and diameter through said coin passageway, said gate means and separator means having adjustment means for adjusting said selected thickness and diameter for a selected coin denomination;
counter means disposed in said coin passageway beyond said gate means and separator means for counting coins conveyed through said coin passageway to said coin outlet means and for storing the count; and
totalizer means cooperating with said counter means having input means for registering the monetary value of the selected denomination of coin and means for computing and storing the monetary value of the coins counted by said counter means.

4,442,851

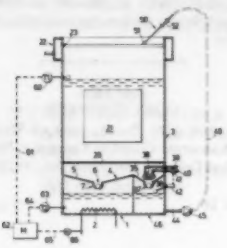
CLEANING OF OBJECTS WITH SOLVENT

Kurt A. Holm, Skoghall, Sweden, assignor to Bycosin AB, Karlstad, Sweden

Filed Jun. 23, 1982, Ser. No. 391,225
Claims priority, application Sweden, May 24, 1981, 8103968
Int. Cl.³ B08B 3/02
U.S. Cl. 134—106 2 Claims

1. Apparatus for cleaning objects by means of solvent, comprising a container for liquid solvent, a heat-source arranged at the container for evaporation of solvent, and a vessel which is arranged to receive an object to be cleaned, said vessel communicating via an opening in the bottom thereof with the container to be fed with solvent vapour from the container, and said vessel being disposed on a higher level than the container to make possible the return of solvent condensate by gravity from the vessel to the container, characterized in that a valve means is arranged at the opening, the valve means comprises a seat surrounding the opening, and a body sealing against the seat and disposed to float up from contact with the

seat in the presence of liquid solvent, and that the valve means is disposed to permit solvent vapour pressurized by the heat source to pass from the container to the vessel and to prevent



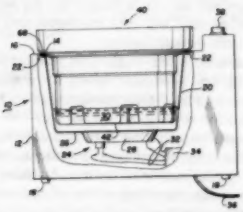
evaporation of solvent from the container to the vessel when the solvent in the container is kept at a temperature below the boiling point of the solvent.

4,442,852

ULTRASONIC CLEANER APPARATUS

C. Dennis Lord, P.O. Box 47642, Dallas, Tex. 75247

Filed Jul. 30, 1982, Ser. No. 403,288
Int. Cl.³ B08B *3/12*
U.S. Cl. 134—135 **19 Claims**



1. Apparatus for ultrasonic cleaning, said apparatus comprising:

(a) a support housing;

(b) an aperture of predetermined shape and size formed in a top surface of said support housing;

(c) a cleaning tank positioned within said aperture and supported from said support housing, said cleaning tank being configured to support a cleaning solution to a predetermined depth in said cleaning tank, said cleaning tank including a bottom portion lying substantially in a horizontal plane;

(d) transducer means physically attached to the exterior bottom surface of said bottom portion of said cleaning tank by fastening means;

(e) excitation means connected to said transducer means for excitation thereof to produce cavitation in said cleaning solution and provide resultant cleaning of predetermined items placed in said cleaning tank; and

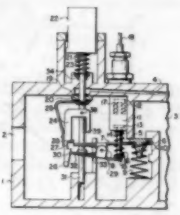
(f) a basket-type container configured to be inserted into the cleaning tank while being supported by the top surface of said support housing.

4,442,853

SAFETY GAS VALVE WITH LATCH

Ydo Gort, Aalden, Netherlands, assignor to Honeywell B.V., Amsterdam, Netherlands

Filed Sep. 27, 1982, Ser. No. 423,873
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133075
Int. Cl.³ F23D *17/46*
U.S. Cl. 137—66 **7 Claims**



1. Safety gas valve with latch which can be switched on and off by means of a shiftable and turnable operating rod, wherein

a closure member is borne by a lever turnable around a stationary axis and is spring biased in closing direction by means of a spring;

an operating rod carries a spring biased tiltable latch, the tilting axis of which extends perpendicularly with respect to the direction of movement of the operating rod; and

a projection of the latch is located opposite the lever arm of the lever which does not carry a closure member in such a way that during back movement of the operating rod from the ignition position into the operating position, the projection turns lever and with it closure member into the open position of the valve,

whereby, if the valve were closed by turning the operating rod, an abutment of the latch is positioned opposite a stationary abutment and prevents pressing the operating rod until the armature of the electromagnet turns the latch out of the latching position when the electromagnet ceases to be energized by the current of a thermocouple; comprising

an electromagnet of the ignition safety device is provided at the same side of the valve housing as is a push button borne by the operating rod;

a second lever is tiltable around the stationary axis;

a spring biased armature of the electromagnet engages at the one lever arm of the second lever;

a projection of the operating rod is positioned opposite the other lever arm of the second lever is such a manner that, when pushing the operating rod, the second lever presses the armature of the electromagnet against its core; and

another lever arm is positioned opposite an inclined surface of the latch and turns this latch when the armature drops out in such a manner that the operating rod is released.

4,442,854

ELECTRO-PNEUMATIC SIGNAL CONVERTER

Stig Norder, and Lars-Erik Nilsson, both of Säffle, Sweden, assignors to Aktiebolag Somas Ventiler, Saffle, Sweden

Filed Jan. 20, 1982, Ser. No. 341,018
Claims priority, application Sweden, Feb. 9, 1981, 8100874
Int. Cl.³ F16K *31/02*; G05D *16/00*
U.S. Cl. 137—82 **5 Claims**

1. An electro-pneumatic signal converter for converting an electrical current signal into a pneumatic pressure, said converter comprising:

a coil through which an electrical current signal flows, said coil generating a coil magnetic field when said electrical current signal flows through said coil;

a magnetic circuit including a core of ferromagnetic material

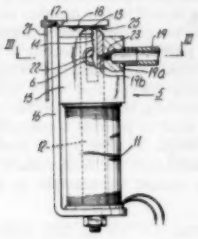
disposed in said coil, said core having a first end and a second end;

a nozzle chamber in said core having a mouth in the form of a nozzle in said first end of said core;

a flapper of ferromagnetic material extending over said nozzle and defining a gap between said nozzle and said flapper;

a link of ferromagnetic material completing a magnetic circuit between said flapper and said second end of said core;

a feed line for a constant flow of feed air into said nozzle chamber and out through said nozzle into said gap;



a body of electrically conducting non-ferromagnetic material surrounding said core in a region near said first end of said core, said body generating a core magnetic field in said core as a result generation of an induced current in said body due to alterations in current in said coil, said core magnetic field being oppositely directed to said coil magnetic field, said core magnetic field exerting a damping effect on movement of said flapper; and

a pressure sensing line extending from said nozzle chamber to a pressure-dependent member for transmitting a pneumatic pressure signal from said nozzle chamber to said pressure-dependent member.

4,442,855

FAIL-SAFE SINGLE-STAGE SERVOVALVE

Stanley J. Hoffman, Jr., Cheektowaga, and William D. Waffner, East Aurora, both of N.Y., assignors to Moog Inc., East Aurora, N.Y.

Filed Oct. 28, 1981, Ser. No. 315,748
Int. Cl.³ G05D *16/00*
U.S. Cl. 137—83 **27 Claims**

1. In a single-stage servovalve having a body, wherein a fluid jet is adapted to be discharged toward at least two receiver passages, and having a movable member mounted on said body, the position of said movable member relative to said body within an operating range of movement being adapted to divide said fluid jet between said receiver passages, the improvement which comprises:

a first stop mounted on said body and operatively arranged to limit further movement of said member in one direction; and

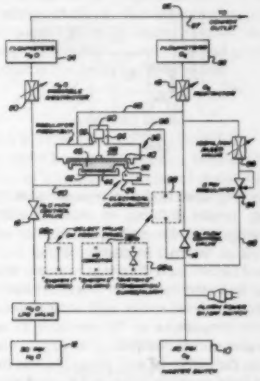
a first deflector surface mounted on one of said body and member and operatively arranged to create substantially equal jet impingement onto said receiver passages when said member engages said first stop.

4,442,856

OXYGEN REGULATOR AND ALARM SYSTEM FOR AN ANESTHESIA MACHINE

Karl Betz, Dix Hills, N.Y., assignor to Puritan-Bennett, Kansas City, Mo.

Filed Aug. 18, 1981, Ser. No. 293,993
Int. Cl.³ A61M *17/00*
U.S. Cl. 137—98 **11 Claims**



1. An oxygen regulator and alarm system for use in conjunction with a gas anesthesia machine, said system comprising:

a regulator assembly having

a first chamber,

a first diaphragm serving as a wall of said first chamber,

a second chamber,

a second diaphragm serving as a wall of said second chamber,

an intermediate member disposed between and in contact with said first and second diaphragms and movable therewith, and

an alarm switch operable by movement of said intermediate member;

an oxygen flow restrictor connected between a flow controllable oxygen supply and a common outlet;

an anesthesia gas flow restrictor connected between a flow controllable supply of anesthesia gas and the common outlet;

an oxygen pressure line between the supply side of said oxygen flow restrictor and said first chamber;

an anesthesia gas pressure line between the supply side of said anesthesia gas flow restrictor and said second chamber; and

an oxygen bypass line for connecting said first chamber directly to a supply of oxygen;

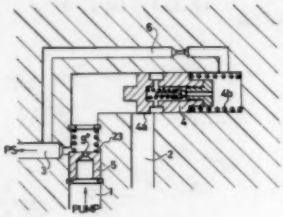
wherein the area of said diaphragm is greater than the area of said second diaphragm by a factor suffucient to provide equal pressure forces on said diaphragms when the percentage flow rate of oxygen is at a desired safety level;

and wherein said regulator assembly further includes a regulator valve for controlling the flow of oxygen into said first chamber from said oxygen bypass line, in response to movement of said intermediate member, whereby a too low percentage of oxygen causes said regulator valve to open, increasing the oxygen pressure in said first chamber and supplying additional oxygen to the common outlet through said oxygen bypass line, said first chamber and said oxygen pressure line.

4,442,857
FLOW CONTROL VALVE

Takeshi Ohe, and Haruo Okamoto, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 211,594, Dec. 1, 1980, Pat. No. 4,343,324, which is a continuation of Ser. No. 970,310, Dec. 18, 1978, abandoned. This application Feb. 5, 1982, Ser. No. 346,429
Int. Cl.³ G05D *11/02*
U.S. Cl. 137—117 **2 Claims**

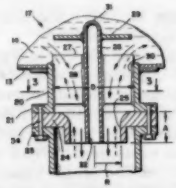


1. A valving system for a power assist hydraulic system comprising: means defining an external utilization hydraulic circuit having an intake section; a pump for supplying hydraulic fluid and an internal hydraulic circuit receiving said fluid; said internal circuit including sensor means to divert fluid from delivery to said external circuit to a recirculation passage when a predetermined level exists; said sensor means including first valve means responsive to the pressure at said pump outlet, said first valve means comprising an orifice disposed for movement across the outlet of said pump, means to bias said orifice against the fluid pressure produced by said pump, and means to establish fluid communication between said pump and said intake section when the biasing force of said means to bias said orifice exceeds the fluid pressure produced by said pump, said first valve means being responsive to the pressure differential across said orifice, such that, upon said pressure differential exceeding a predetermined value, said first valve means operates to reduce fluid delivery to said external circuit to a predetermined minimum positive fluid delivery rate, and second valve means located upstream of, and responsive to, the pressure differential upstream and downstream of said first valve means, whereby when the fluid supply in said intake section reaches a predetermined level said second valve means diverts flow of hydraulic fluid from said intake to said recirculation passage while said first valve means allows at least said predetermined minimum positive fluid delivery rate.

4,442,858
SURGE CHAMBER

Wilhelm S. Everett, P.O. Box 1535, Ventura, Calif. 93001

Filed Feb. 8, 1982, Ser. No. 346,727
Int. Cl.³ F04D *27/02*
U.S. Cl. 137—207 **6 Claims**



1. A surge chamber having an outflow/inflow control fitting on its bottom, said fitting including, in combination:

(a) a surge chamber pipe section of given inside diameter secured in the bottom wall of said chamber in communication with the interior thereof, said pipe section extending downwardly away from the chamber and having a first exterior annular flange on its lower end;

(b) an outlet pipe section of said given inside diameter and having a second exterior companion annular flange on its upper end;

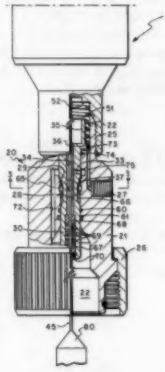
(c) an annular nozzle member defining a reduced diameter opening less than said given diameter, positioned between and in coaxial alignment with the first and second annular flanges; and

(d) a coaxially positioned core member carrying radially extending anti-vortex blades centrally positioned in said surge chamber pipe section with the lower end of said core member passing coaxially within said reduced diameter opening in said nozzle member and terminating in the plane of the lower end of said reduced diameter opening, said outlet pipe section connecting to a pipeline carrying a column of fluid being pumped to a higher level by pumps in a pumping station, said inside diameter and reduced diameter opening, and the geometry of said nozzle member being sized to provide a controlled outflow of fluid from said surge chamber to said pipeline in a manner to avoid separation of said fluid column in the event of failure of the pumps, for example, as a result of a power outtage.

4,442,859
CONTROL VALVE

Ernest B. Gentry, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed May 13, 1981, Ser. No. 263,163
Int. Cl.³ F16K *15/00, 31/143*
U.S. Cl. 137—242 **8 Claims**



6. A valve comprising:

a. a housing having a first longitudinal passageway extending therethrough;

b. a poppet means slidably disposed within the first longitudinal passageway;

c. the poppet means having a longitudinal bore extending therethrough;

d. first seal means for blocking fluid flow between the exterior of the poppet means and the interior of the first longitudinal passageway;

e. second seal means for blocking fluid flow between the exterior of the poppet means and the interior of the first longitudinal passageway;

f. the first and second seal means spaced longitudinally from each other and partially defining a fluid chamber within the first longitudinal passageway;

g. port means for communicating fluid from the exterior of the housing to the fluid chamber;

h. the poppet means having a first position in which the first

seal means blocks fluid communication between the chamber and other portions of the first longitudinal passageway and a second position in which the first seal means allows fluid communication between the chamber and other portions of the first longitudinal passageway;

i. means for biasing the poppet means towards its first position;

j. an opening through the poppet means communicating between the longitudinal bore and the first longitudinal passageway;

k. the first seal means located between the opening and the fluid chamber;

l. means for attaching the housing to a wireline lubricator assembly;

m. the biasing means comprising a spring disposed between a shoulder formed on the inside diameter of the housing and a similar shoulder on the poppet means;

n. the longitudinal bore extending completely through the poppet means and sized to slidably receive a flexible wireline therein; and

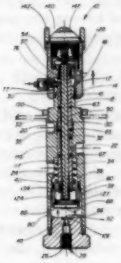
o. packing means carried within the longitudinal bore to wipe the wireline as it slides through the bore.

4,442,860

PILOT CONTROL RELAY VALVE APPARATUS

Donald K. Taylor, Humble, Tex., assignor to C.S.E. Automation Engineering & Services, Inc., Doucon, La.

Filed Oct. 26, 1981, Ser. No. 315,258
Int. Cl.³ F16K *17/00*
U.S. Cl. 137—557 **2 Claims**



1. A pilot operated relay control valve apparatus comprising:

a. a first elongated housing having a bore extending longitudinally thereof;

b. a second elongated housing having a bore coaxially aligned with the bore of said first housing;

c. an annular neck portion of said first housing for slidably engaging the inner wall of a portion of the bore of said second housing;

d. a slide valve mounted within said coaxial bores for longitudinal movement thereof, said slide valve having:

i. a first piston on one end of said slide valve, mounted within an enlarged diameter portion of the bore of said first housing, a face of said first piston adapted with a plurality of appertures therethrough;

ii. a counter-bore extending substantially the length of said slide valve;

iii. displacement means mounted within said counter-bore for longitudinal movement thereof, said displacement means having a second piston on one end thereof coaxially mounted within said first piston;

e. means for continuously urging said first piston of said slide valve inwardly to a seated position;

f. means for continuously urging said second piston to a seated position against said first piston;

g. port means in fluid communication with said bore of said first housing and exposing the outer face of said first piston to fluid pressure;

h. a raised annular portion on the outer face of said first piston in alignment with said port means;

i. a resilient annular seal between said port means and said raised annular portion on the outer face of said piston exposing a relatively small surface area of said first piston is in a seated position, said annular seal permitting the entire outer face of said first piston to be exposed to fluid pressure from said port means when said first piston is out of the seated position;

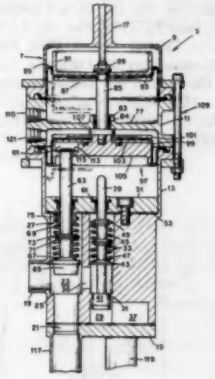
j. indicator means mounted on one end of said control valve for movement between a first position to indicate a first operating condition and a second position to indicate a second operating condition, said indicator means moving from said first and second positions thereof whenever a predetermined high fluid pressure is applied to and unseats said second piston the from the first piston.

4,442,861

VALVE FOR GAS CENTRIFUGES

Charles A. Hahs, and Charles H. Burbage, both of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 358,963
Int. Cl.³ F16K *11/14, 31/126*
U.S. Cl. 137—595 **11 Claims**



1. A valve assembly, comprising:

(a) a casing having an axis, said casing including a portion formed with a vent,

(b) an axially displaceable diaphragm assembly sealably bridging said casing and including a shaft extending along said axis, said assembly and the vented portion said casing defining a vented chamber,

(c) a partition in said casing including means for slidably engaging said shaft, said partition and diaphragm assembly defining a sealed second chamber,

(d) a port in said casing for admitting, to the second chamber, actuating-fluid means for effecting displacement of said diaphragm assembly away from said partition to a normal operating position,

(e) an axially displaceable actuator-plate assembly sealably bridging said casing and supported by said shaft, said plate assembly and partition defining a third chamber,

(f) a seal plate bridging said casing and formed with through-going bores extending in the direction of said axis, said seal plate and actuator-plate assembly defining a fourth chamber,

(g) a body in said casing having a plurality of passages respectively aligned with said bores and respectively containing valve seats, and

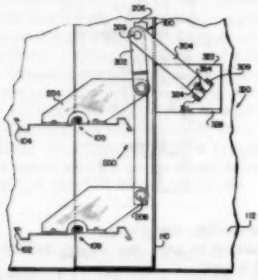
(h) a plurality of shafts which are coupled to said plate assembly to move axially therewith, said shafts respectively extending through said bores and into said passages and carrying plugs which are out of contact with said seats when said diaphragm assembly is in said normal position.

4,442,862

LINK BAR OPERATOR FOR ROTATING BLADE DAMPERS

Francis J. McCabe, 239 Hastings Ct., Doylestown, Pa. 18901

Continuation-in-part of Ser. No. 154,713, May 30, 1980, Pat. No. 4,338,967, which is a continuation-in-part of Ser. No. 16,514, Mar. 1, 1979, Pat. No. 4,301,569, which is a continuation-in-part of Ser. No. 896,299, Apr. 14, 1978, Pat. No. 4,195,384, which is a continuation-in-part of Ser. No. 799,044, Mar. 18, 1977, Pat. No. 4,099,292, which is a continuation of Ser. No. 676,483, Apr. 13, 1976, Pat. No. 4,041,570, and a continuation-in-part of Ser. No. 676,413, Apr. 13, 1976, Pat. No. 4,040,304, said Ser. No. 16,514, is a continuation-in-part of Ser. No. 764,774, Feb. 2, 1977, Pat. No. 4,114,646, which is a continuation of Ser. No. 689,994, May 26, 1976, Pat. No. 4,081,173, said Ser. No. 16,514, is a continuation-in-part of Ser. No. 896,237, Apr. 14, 1978, Pat. No. 4,219,041, said Ser. No. 16,514, is a continuation-in-part of Ser. No. 905,211, May 12, 1978, Pat. No. 4,183,129, which is a division of Ser. No. 729,813, Oct. 4, 1976, Pat. No. 4,113,232.
This application May 26, 1981, Ser. No. 267,334
The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.
Int. Cl.³ F24F 13/14; F16K 1/22
U.S. Cl. 137—601 29 Claims



1. An operator for operating a damper having a frame and at least one blade adapted for rotation within the frame between an open position and a closed position, wherein said operator comprises:

(a) at least two, pivotally interconnected operator members, a first operator member being operatively associated with the frame of the damper and a second operator member being operatively associated with the damper blade; and

(b) acutator means operatively associated with at least one of the two operator members;

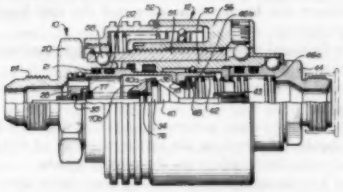
wherein operation of the actuator means causes articulation of the operator members, which in turn causes rotation of the damper blade, so that the amount of rotation of the damper blade which is caused by a given amount of operation of the actuator means increases as the damper blade moves toward the open position, and so that changes in air flow through the damper essentially directly relate to a given amount of operation of the actuator means.

4,442,863

FLUID LINE COUPLING DEVICE

Vincent G. Magorien, Granada Hills, Calif., assignor to Systron Donner Corp., Concord, Calif.

Filed Apr. 30, 1981, Ser. No. 258,919
Int. Cl.³ F16L 29/00
U.S. Cl. 137—614.03 8 Claims



1. In a fluid line connector having a male half and a female half, each separately valved to open as the halves are connected and to close as the halves are disconnected, an improved male valve assembly, comprising:

a tubular body having an end wall with an opening therein forming a conical valve seat;

a valve having a corresponding concially tapered surface, an annular shoulder adjacent to said tapered surface and a valve stem mounted for axial sliding movement within said tubular body;

an O-ring seal disposed on said annular shoulder of said valve;

a cupped seal retainer mounted for sliding movement along said valve stem and having an annular retaining lip capable of extending around said seal over more than half of its thickness;

first biasing means for urging said valve into engagement with said valve seat; and

second biasing means for urging said seal retainer, and with it said seal, into sealing engagement with said valve seat when in the disconnected condition;

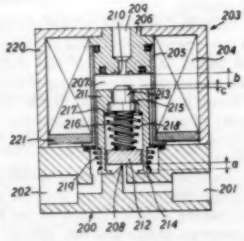
wherein said seal retainer is prevented from interfering with said end wall by reaction forces generated by said seal in the disconnected condition, and wherein said seal retainer retains said seal to an even greater extent in the connected condition, thereby minimizing seal washout in conditions of high flow.

4,442,864

ELECTROMAGNETIC SWITCHING VALVE

Seiji Kosugi, Soka, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,560
Int. Cl.³ F16K 11/16; F15B 13/044
U.S. Cl. 137—625.27 1 Claim



1. An electromagnetic switching valve, comprising:

a valve main body including a valve chamber, an inlet port and an outlet port;

a stationary core disposed in said valve main body and including a fluid discharge port, said stationary core disposed in said valve main body so as to form an end of said valve chamber;

a guide cylinder disposed in said valve chamber adjacent said stationary core;

a feed valve seat formed in said valve main body for fluidically interconnecting said inlet port to said outlet port via said valve chamber;

a discharge valve seat formed in said stationary core in opposed relation to said feed valve seat and wherein said discharge valve seat is fluidically interconnected to said valve chamber and said fluid discharge port;

a movable core reciprocatably disposed in said guide cylinder;

a discharge valve body reciprocatably disposed in said movable core and adapted to cooperate with said discharge valve seat for opening and closing thereof;

a feed valve body reciprocatably disposed in said movable core and adapted to cooperate with said feed valve seat for opening and closing thereof;

a return spring disposed in said valve chamber and adapted to cooperate with said guide cylinder and said movable core to urge said movable core in a direction for closing said feed valve seat and to cause said discharge valve body and said feed valve body to move to decrease a linear distance therebetween to less than a predetermined maximum value;

an inter-valve spring compressedly disposed between said discharge valve body and said feed valve body and adapted to cooperate therewith so as to cause said discharge valve body and said feed valve body to move to increase said linear distance therebetween to said predetermined maximum value;

an auxiliary spring disposed in said movable core and adapted to cooperate with said movable core and said feed valve body to urge said feed valve body away from said discharge valve body and wherein a force of said return spring is greater than a combined force of said inter-valve spring and said auxiliary spring; and

means for generating an electromagnetic force such that when said electromagnetic force generating means is deenergized said movable core abuts a bottom of said valve chamber due to said force of said return spring, said feed valve body closes said feed valve seat due to said combined force of said inter-valve spring and said auxiliary spring and said linear distance between said discharge valve body and said feed valve body is less than said predetermined maximum value, and when said electromagnetic force generating means is energized said movable core is drawn into abuttment with said stationary core and said discharge valve body to close said discharge valve seat due to an inter-valve spring force.

4,442,865

MECHANISM FOR CHANGING OVER FLUID PASSAGES

Nakashima Shigeo, Muko, Japan, assignor to Nakashima Seisakusho Co., Ltd., Kyoto, Japan

Filed Oct. 21, 1981, Ser. No. 314,001
Claims priority, application Japan, Nov. 14, 1980, 55-161288
Int. Cl.³ F16K *11/06*
U.S. Cl. 137—874 **2 Claims**

1. A fluid passages change-over mechanism, comprising:

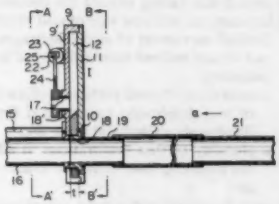
a circular casing having a central opening;

a circular rotating plate axially aligned with said casing, having an axle extending outwardly from the center of one side thereof through said central opening in said casing so as to be rotatable therein about an axis rotation;

a circular casing cover axially aligned with said casing and said plate, having an arc-shaped opening surrounding said axis of rotation at a constant radial distance therefrom; said casing having first and second holes along a first arc about said axis, said first arc having a radius equal to said constant radial distance, said plate having a third hole at a distance equal to said constant radial distance from said axis, said plate being disposed between said casing and said cover so to be covered thereby;

first and second circuit pipes respectively mounted at one end to said casing in alignment with said first and second holes, the other end of said circuit pipes extending away from said plate;

one swing pipe mounted at one end thereof to said plate in alignment with said third hole, the other end of said one swing pipe extending through said arc-shaped opening so



as to be rotatable with said plate between opposite circumferential ends of said arc-shaped opening, said one swing pipe respectively communicating with said first and second circuit pipes through said first and second holes when said one swing pipe is at the respective opposite ends of said arc-shaped opening;

a main pipe;

a flexible pipe connecting said other end of said one swing pipe to one end of said main pipe; and

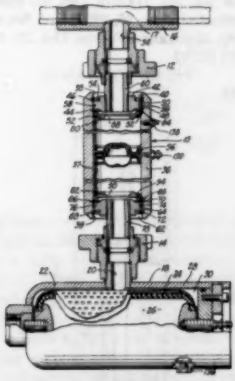
torque means, connected to said axle, for reciprocally rotating said one swing pipe with said plate between said opposite ends of said arc-shaped opening.

4,442,866

SLIDING SEPARATOR FOR PULSATING LINES

Ernest W. Loukonen, Box 1611, Long Beach, Calif. 90815

Filed Sep. 27, 1982, Ser. No. 423,855
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—31 **10 Claims**



1. A separator to isolate a pulsating fluid from a pulsation damping fluid which passes pulsating energy therebetween including:

a body defining an inner cylindrical bore therein, said defined inner cylindrical bore having:

a first end for connection to the pulsating fluid; and

a second end for connection to the pulsation damping fluid;

a piston positioned in said defined inner cylindrical bore, said piston having:

a central diaphragm for passing high frequency energy pulsations between the pulsating fluid and the pulsation damping fluid;

a outer cylindrical surface positioned to slide on said defined inner cylindrical bore, whereby said piston can move on said defined inner cylindrical bore to pass low frequency energy pulsations between the pulsating fluid and the pulsation damping fluid;

a first side facing toward the pulsating fluid;

a second side facing toward the pulsation damping fluid;

a first cage on said first side of said piston shaped to allow limited movement of said diaphragm toward said first end of said defined inner cylindrical bore, said first cage including:

a central cup shaped portion to allow limited movement of said diaphragm toward said first end of said defined inner cylindrical bore; and

a plurality of first perforations to allow movement of the pulsating fluid therepast to act on said diaphragm; and

a second cage on said second side of said piston shaped to allow limited movement of said diaphragm toward said second end of said defined inner cylindrical bore, said second cage including:

a central cup shaped portion to allow limited movement of said diaphragm toward said second end of said defined inner cylindrical bore; and

a plurality of second perforations to allow movement of the pulsation damping fluid therepast to be acted upon by said diaphragm; and

a sensor port positioned through said defined inner cylindrical bore generally equidistant from said first and second ends thereof, said sensor port being manually openable whereby any fluid flowing out thereof indicates the position of said piston along said defined inner cylindrical bore.

4,442,867

INTERNAL OBTURATORS FOR PIPES

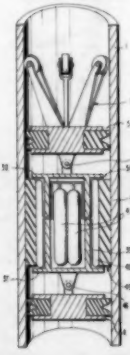
Bruno J. M. de Sivry; Jean-Louis Migliarese-Caputi, both of Paris, and Daniel Josien, Willems, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Continuation of Ser. No. 311,802, Oct. 15, 1981, abandoned. This application Apr. 15, 1983, Ser. No. 483,747

Claims priority, application France, Oct. 29, 1980, 80 23089; Feb. 25, 1981, 81 03716

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—93 **4 Claims**



1. An internal obturator for a pipe, comprising: a rigid hollow cylindrical unit defined by a hollow central cylinder **(39)** closed at its opposite ends by two circular plates **(37, 38)** having annular flanges extending radially outwardly beyond said cylinder, an elongated torus shaped inflatable element **(40)** disposed around said cylinder, and a flexible sealing wall **(48)** of cylindrical shape disposed around said inflatable element for sealing application thereby against the internal wall of a pipe, said sealing wall comprising a cylindrical sleeve independent of said inflatable element and retained at its two ends against longitudinal displacement by said circular plates, said inflatable element comprising a single inflatable bladder of annular cross-section inserted between said cylinder and said cylindrical sleeve and having a length approximately the same as that of said cylindrical sleeve, wherein said cylindrical sleeve comprises a deformable cylindrical body freely inserted between said end plates, the axial length of said cylindrical sleeve substantially corresponds to the axial distance between said circular plates, and the portions of the axial ends of said cylindrical sleeve which are, in use, applied against said end plates are made of a stronger material than that of which the remainder of said sleeve is made.

4,442,868

FOOD CASING WHICH WILL TRANSFER A SMOKE COLOR AND FLAVOR TO FOOD ENCASED THEREIN AND BASIC NATURAL LIQUID SMOKE FOR USE THEREWITH

Burl L. Smith, Danville, Ill., and Ronald S. Kearby, State Line, Ind., assignors to Teepak, Inc., Chicago, Ill.

Filed Sep. 24, 1982, Ser. No. 423,410

Int. Cl.³ A22C *13/00*

U.S. Cl. 138—118.1 **33 Claims**

1. A casing for meat products comprising a tube, impregnated with a colorant and flavorant comprising a basic liquid smoke coloring and flavoring solution alkalized to a pH above about 10.

18. The method of forming a storage stable food casing of claim **1** capable of imparting a smoke color and flavor to a meat product cooked therein comprising providing a food casing and impregnating said casing with a natural smoke flavorant and colorant having a pH of from between about 10 and about 12.5.

4,442,869

APPARATUS FOR THE OPTICAL RETENTION OF THE TWO RECIPROCATINGLY DRIVEN CONTROL ELEMENTS OF THE SHED FORMING ARRANGEMENT ASSOCIATED WITH A LOOM

Francisco Speich, Gipf-Oberfrick, and Robert Bucher, Frick, both of Switzerland, assignors to Textilma AG, Hergiswil, Switzerland

Filed Dec. 14, 1981, Ser. No. 330,328

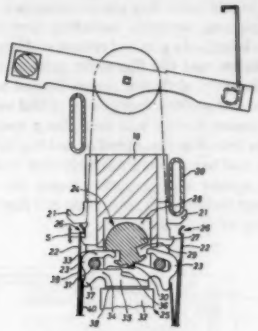
Claims priority, application Switzerland, Dec. 22, 1980, 9530/80

Int. Cl.³ D03C *1/06*

U.S. Cl. 139—71 **16 Claims**

1. Apparatus for the optical retention in one of the limiting positions of two reciprocatingly driven control elements of a shed forming arrangement associated with a loom, comprising retaining elements associated with the control elements and adapted to be moved from a first position into a second position and projecting in one position into the path of motion of the control elements in order to retain these in one limiting position, an actuating means with actuating elements adapted to act on the retaining elements, a drive mechanism associated with the actuating elements adapted to move the retaining elements from the first into the second position, an electrically energizable control device for the selective control of the actuating elements, the actuating elements having an elongated slot, and wherein there is provided a pivot pin projecting into said slot such to allow a pivoting and translatory sliding motion of said

actuating elements in order to move them into and out of contact with the control device and to slide the actuating



elements towards the retaining elements when the control device is not energized.

4,442,870

BRAKE FOR A GRIPPER PROJECTILE OF A WEAVING MACHINE

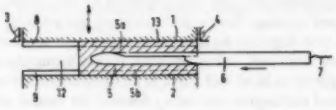
Frantisek Jankovsky, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Nov. 5, 1981, Ser. No. 318,612

Claims priority, application Switzerland, Nov. 7, 1980, 8275/80

Int. Cl.³ D03D *49/54*

U.S. Cl. 139—185 **7 Claims**



1. A brake for a gripper projectile of a weaving machine comprising

a clamp-shaped receiving member for catching a moving gripper projectile; and

a pair of brake shoes for slidably receiving said receiving member therebetween.

4,442,871

WEFT YARN GUIDE FOR A FLUID JET LOOM

Hajime Suzuki, Anjo; Yoshifumi Umemura, Toyoake; Yoshimi Iwano, Oobu, and Masahiko Kimbara, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Jun. 25, 1980, Ser. No. 163,212

Claims priority, application Japan, Jun. 30, 1979, 54/090407[U]

Int. Cl.³ D03D *47/30*

U.S. Cl. 139—435 **5 Claims**

1. A weft yarn guide for a fluid jet loom comprising:

a base portion capable of being connected to a sley;

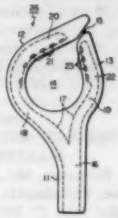
a pair of guide members which are connected to the upper end of said base portion and which are forked to form a weft inserting opening therebetween;

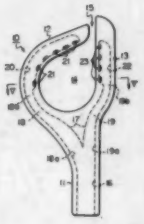
a base fluid passage formed within said base portion, and;

a plurality of fluid blowing holes which are formed on the upper surface of said forked guide members but are not formed on the lower surface of said forked guide members and which are communicated with said base fluid passage,

characterized in that said guide further comprises:

a branching wall which projects from the upper inner wall of said base fluid passage toward the inside of said fluid passage, and;





a pair of branch passages, the lower ends of which communicate with said base fluid passage and which communicate with said fluid blowing holes.

4,442,872

APPARATUS AND METHOD FOR THE PRODUCTION OF WIRING LOOMS

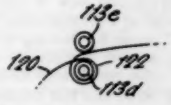
Ralph D. Gibbons, Basingstoke, England, assignor to Lansing Bagnall Limited, Hampshire, England

Continuation-in-part of Ser. No. 56,730, Jul. 11, 1979, abandoned. This application Sep. 18, 1981, Ser. No. 303,502

Claims priority, application United Kingdom, Jul. 17, 1978, 30134/78; Mar. 25, 1981, 8109431

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.1 **25 Claims**



1. A wiring loom comprising a plurality of pins, each having end portions and an intermediate portion wider than the end portions, and a table adapted for receiving and releasably holding a plurality of said guide pins in a position to project on one side of the table at predetermined points thereon, the table comprising first and second superposed parallel layers of which said first layer has an array of apertures through which end portions but not intermediate portions of said pins can pass and of which said second layer is adapted to receive and inhibit lateral movement of end portions of the pins, whereby to hold each of said pins in position as aforesaid, and actuator means for effecting relative separation of said layers in a direction normal to said layers sufficient to release the end portions of the pins from the said second layer and effecting removal of the pins from the table.

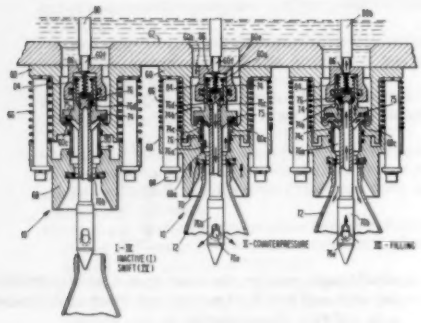
(8) subsequently replacing the uppermost layer relative to the intermediate layer; and subsequent to the production of a multiplicity of similar harnesses, the further step of:
(9) separating the uppermost and intermediate layers from the lower layer in a direction normal to the layers to release the pins from the loom table.

4,442,873

CONTAINER ACTUATED COUNTERPRESSURE FILLING VALVE

Chung J. Yun, Baltimore, Md., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Filed Nov. 27, 1981, Ser. No. 325,289
Int. Cl.³ B67C *3/06*
U.S. Cl. 141—39 **21 Claims**



1. Apparatus for the counterpressure filling of a container with a pressurized carbonated liquid comprising:
a first valve member;
means for moving said container to sealably engage the mouth of the container with said first movable valve member and to move said first movable valve member to admit counterpressure gas into said container;
a second valve member in communication with a reservoir of said pressurized liquid and normally held closed by the pressure of the liquid thereon and biased to open when the counterpressure within said container is substantially equal to the pressure of said carbonated liquid, whereby said second valve member opens after said container is counterpressurized, to admit said carbonated liquid into said container; and
means for terminating flow of said carbonated liquid into said container at a predetermined point,
wherein said means for moving said container relative to said valve member additionally removes said container from said valve means after termination of flow of said carbonated liquid into said container and closes said first and second valves.

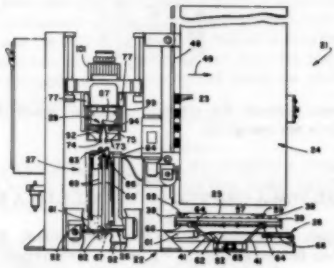
4,442,874

AUTOMATIC VALVE BAG PLACER

Jack V. Ballard, Jr., Morristown, N.J., assignor to John L. Macfarlane, Modesto, Calif.

Filed Jun. 17, 1982, Ser. No. 389,410
Int. Cl.³ B65B *1/00*
U.S. Cl. 141—166 **15 Claims**

1. An automatic valve bag placer for opening and sequential positioning of valve bags for filling through a fill spigot, said valve bags each including an end flap folded against the bag body and a fill valve mounted in said end flap; and said valve bag placer including, a flap orienting assembly formed for rotation of said end flap to a position for opening of said valve, a bag feeding assembly formed to feed individual bags sequentially to said orienting assembly, a bag opening and filling assembly formed to open said valve after orientation by said orienting assembly and formed to displace one of said bags and said fill spigot to a position for filling of said bag, wherein the improvement in said valve bag placer comprises:
said flap orienting assembly including first clamp means formed to selectively grip and release said bags at a spaced distance below said end flap while positioned in said bag feeding assembly, deflector means formed to rotate said end flap to said position for opening of said valve, and first carriage means having said first clamp means mounted thereto for lateral displacement of said bag to remove said bag from said bag feeding assembly and to displace said end flap against said deflector means for cooperative engagement therewith to rotate said end flap to a position for opening of said valve; and



said bag opening and filling assembly including second clamp means formed to selectively grip and release said bag immediately below and proximate said end flap, second carriage means having said second clamp means mounted thereto, and valve opening means carried by said second carriage means and movably mounted to engage said end flap and to open said valve, said second clamp means and said valve opening means being formed to cooperate to hold said valve in an open condition and said second carriage means being formed for lateral displacement of said bag and insertion of said fill spigot into the open valve.

4,442,875

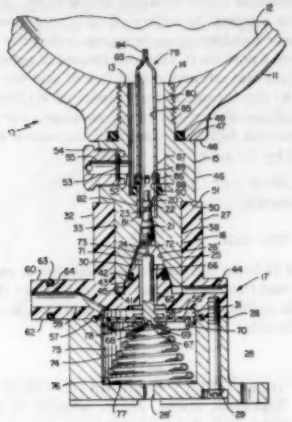
PROPELLANT CHARGING HEAD FOR FILLING A STORAGE CHAMBER OF A PROPELLANT STORAGE CONSTRUCTION

Francis S. Genbauffe, Irwin, and Joseph J. Erdelsky, Jeannette, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 9, 1981, Ser. No. 328,959
Int. Cl.³ B65B *3/04*; B67C *5/37*
U.S. Cl. 141—348 **7 Claims**

1. In a propellant charging head for filling a storing chamber of a propellant storage container with a charge of propellant through a passage defining means of said container that has a valve unit in the passage thereof, said head having a surface, said head having a projection that extends beyond said surface, said head having an opening that interrupts said surface and through which propellant is adapted to flow, said head being adapted to have said surface thereof disposed against said container and have said projection of said head engage a valve plunger of said valve unit to open said valve unit so that propellant can flow from said opening of said head through the opened valve unit to said chamber, the improvement wherein said head has a generally conical nose-like member having said

surface of said head thereon, said surface being a generally conical surface and being adapted to seat against a generally



conical seat of said container to interconnect said opening of said head to said passage.

4,442,876

APPARATUS FOR DRYING VENEER SHEET

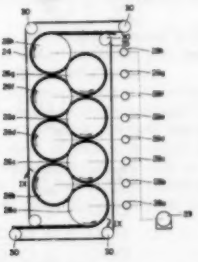
Masaru Koike; Yasumasa Hasegawa; Satoru Shimosaka; Nagara Aoyama, and Toshihiko Yoshizumi, all of Ohbu, Japan, assignors to Meinan Machinery Works, Inc., Ohbu, Japan

Division of Ser. No. 176,995, Aug. 11, 1980. This application Sep. 28, 1982, Ser. No. 425,924

Claims priority, application Japan, Aug. 20, 1979, 54-106408; Dec. 8, 1979, 54-159423

Int. Cl.³ B27M *1/02*

U.S. Cl. 144—2 R **4 Claims**



2. An apparatus for drying a veneer sheet comprising:

a plurality of rollers arranged in two rows staggered such that said rollers have respective axes parallelly extending in corners of a zigzag path and any two adjacent rollers define veneer passages between peripheries thereof, said rollers being driven to feed veneers in a predetermined direction;

plural sets of elongate elements passed over said rollers in sequence along said zigzag path, each set holding a veneer sheet therebetween, said rollers having on peripheral surfaces thereof annular recesses adapted to fully receive roll side elements in said sets, said rollers being heated;

selected rollers being driven at successively decreasing speeds toward said predetermined direction to form a deceleration section; and

a tenderizing device for forming numerous small splits in veneer sheet and located in an upstream portion inclusive of said deceleration section with respect to said predetermined direction.

4,442,877

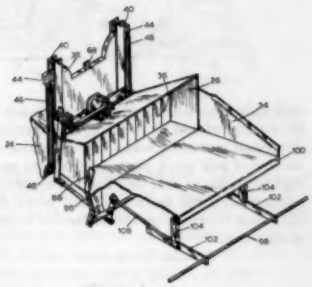
MACHINE CONTROL SYSTEM FOR A WOOD OR BRUSH CHIPPING MACHINE

Edward L. Uitermarkt, Pella, Iowa, assignor to Vermeer Manufacturing Company, Pella, Iowa

Filed May 17, 1982, Ser. No. 379,150

Int. Cl.³ B27L *11/00*

U.S. Cl. 144—172 **8 Claims**



1. A material feed control mechanism for a wood or brush chipping machine having a housing with a material receiving inlet and an outlet for delivering material to a cutter located rearwardly of and adjacent to said outlet, said control mechanism comprising:

(a) an upright material stop gate located forwardly of and adjacent to the housing outlet,

(b) means guidably supporting the stop gate on said housing for vertical movement to an elevated position projected upwardly from the housing to open the outlet to said cutter, and to a lowered position to block material from passing through said outlet to said cutter,

(c) latch means on said housing for releasably holding the stop gate in the elevated position therefor,

(d) a mechanism on said housing for releasing said latch means to drop the stop gate to the lowered position therefor including an operating lever,

(e) a lever system mounted on said housing for actuating said operating lever,

(f) gate detachable means for manually raising said stop gate to the elevated position therefor to provide for a free fall of the stop gate to the lowered position therefor, and

(g) power means complementing said free fall to forcibly urge the stop gate to said lowered position concurrently with the release of said latch means.

4,442,878

HAND-HELD POWER TOOL WITH A MECHANISM

Seki Moriguchi; Katsuo Koizumi, and Sueji Nagayama, all of Katsuta, Japan, assignors to Hitachi Koki Company, Limited, Tokyo, Japan

Filed Aug. 4, 1981, Ser. No. 289,898

Claims priority, application Japan, Aug. 5, 1980, 55-107415

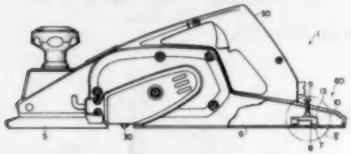
Int. Cl.³ B27C *1/10*

U.S. Cl. 145—4 **13 Claims**

1. A hand-held power tool with a mechanism for straight forwarding, comprising:

(a) a body having at least one slide base arranged to be positioned on and contact a surface of a work piece to be machined, a blade, a blade driving mechanism, and a housing containing therein said blade and said blade driving mechanism; and

(b) a mechanism attached to said body for producing a high degree of friction with respect to the surface of said work piece when said body tends to travel in a direction other than a given direction on the surface of said work piece, said mechanism having a friction member arranged to contact said work piece, and biasing means connected between said body and said friction member such that a portion of said friction member projects outside beyond



said slide base when said slide base is not in contact with the surface of said work piece, said friction member being depressed upwardly when said slide base is placed on the surface of said work piece, said biasing means being sufficiently elastic so that said friction member is pressed into contact with the surface of said work piece when said slide base is placed on the surface of in contact with said work piece.

4,442,879

IRREGULAR WEAR-RESISTANT RADIAL PLY TIRE

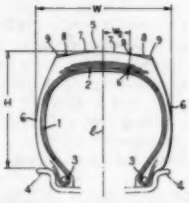
Yukihisa Uemura, Nara, Japan, assignor to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Continuation of Ser. No. 190,789, filed as PCT JP 79/00135, May 29, 1979, published as WO 80/00015, Jan. 10, 1980, § 102(e) Jan. 18, 1980, abandoned. This application Apr. 29, 1982, Ser. No. 372,852

Claims priority, application Japan, Jun. 7, 1978, 53-69209

Int. Cl.³ B60C *11/04, 13/00*

U.S. Cl. 152—209 R **2 Claims**



1. In a radial ply tire having irregular wear resistance comprising a tread portion that consists of central zones extending on both sides of the mid-circumferential line of the tire and near-shoulder zones extending laterally outwardly from said central zones to a lateral shoulder, said near-shoulder zones each being formed with a thickened rubber portion progressively increasing in thickness toward said shoulder, said near-shoulder zones, in the mold-in shape, having a larger radius of curvature (R_2) than that (R_1) of said central zones, the improvement comprising wherein said central zones each are within a straight distance of W_2 measured from said mid-circumferential line of said tire on both sides thereof, said distance W_2 being expressed as follows:

$$W_2 = W/2 - 0.365H$$

wherein W and H are, respectively, a section width and a section height outward of a rim flange of said tire when inflated to a prescribed air pressure, wherein only said control zones are provided with circumferential continuous grooves and said near-shoulder zones are free of continuous grooves; and wherein the mold-in shape of said central zone consists of a curved surface at said radius R_1 to said distance of W_2 from said mid-circumferential line of said tire and a curved surface at said radius R_2 over said near-shoulder zones from said lateral edges of said central zone to a lateral boundary of said near-shoulder zones, said near-shoulder zones being such that the spacing (d) between a position (C) thereon located at a distance of W_1 from said mid-circumferential line of said tire and a position (A) also located at the distance of W_1 from said mid-circumferential line but on an imaginary curved surface extrapolated from said radius of curvature R_1 is represented by the range:

$$0.4\times10^{-2}H \geqq d \geqq 1.5\times10^{-2}$$

and wherein:

$$W_1 = W/2 - 0.2H$$

W and H being the same as defined above; and wherein said tread portion has a curved surface that assumes a single radius of curvature from said central zone to said near-shoulder zone upon inflation.

4,442,880

HEAVY DUTY PNEUMATIC TIRES

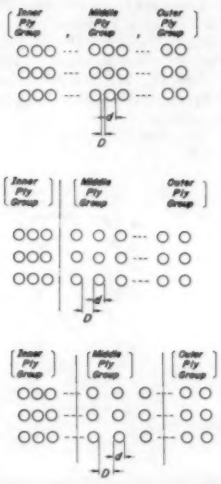
Masanobu Takahashi, Iruma, Japan, assignor to Bridgestone Tire Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 318,494, Nov. 5, 1981, abandoned. This application Apr. 13, 1983, Ser. No. 483,208

Claims priority, application Japan, Nov. 12, 1980, 55-158098; Feb. 16, 1981, 56-20222

Int. Cl.³ B60C *9/06*

U.S. Cl. 152—356 R **2 Claims**

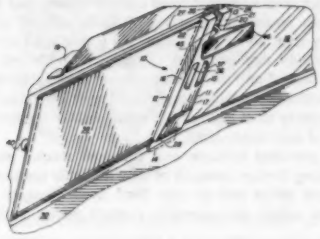


1. A heavy duty pneumatic tire comprising a carcass of a bias structure composed of a least 12 rubberized laminated ply layers each containing organic fiber cords embedded therein, and divided into three groups, an inner group, a middle group and an outer ply group by three bead cores, the cords in said inner, middle and outer ply groups having the same diameter, said cords crossed with each other as a reinforcement for a toroidal casing inclusive of a tread, wherein in a region extending from an upper area of a bead portion of said casing within a range of 0.15 to 0.45 times a tire height as measured from a bead base of the tire, at least an average cord distance between adjacent ply layers at said middle and outer ply groups is made substantially wider than at said inner ply group and, a cord distance between adjacent ply layers at said outer ply group is substantially equal to that at said middle ply group and is within a range of 0.6 to 3.5 times a diameter of said cord used in the outer portion of the toroidal casing.

4,442,881
VEHICLE WINDSHIELD PROTECTIVE CURTAIN

Don Monteath, and Thomas B. Wilson, Jr., both of 3405 N. Dakota, Chandler, Ariz. 85224

Filed Aug. 5, 1982, Ser. No. 405,502
Int. Cl.³ E06B 9/08; B60J 3/00
U.S. Cl. 160—25 **1 Claim**



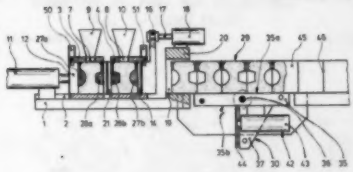
1. A protective device for vehicle windshields comprising:
a unitary housing having sides, ends and a front,
one of said ends being bifurcated to form a pair of spaced protrusions for receiving therebetween when mounted adjacent the windshield the bracket of a rear view mirror of the vehicle,
each of said protrusions having a spring biased tab extending outwardly thereof,
a third tab mounted to extend outwardly of the other end of said housing,
a pair of roller curtains journaled in said housing to extend longitudinally thereof,
an upper end of each of said roller curtains being mounted, one within each of said protrusions of said housing,
the leading edge of said curtains extending out of opposite sides of said housing for withdrawal of at least a part of said curtains from said housing,
means attached to the leading edge of each of said curtains for detachably securing said curtains in their extended positions to the sides of the vehicle adjacent to the windshield, and
spaced finger gripping indentations formed in the front of said housing for use when mounting and removing the device from the windshield of a vehicle,
whereby when said protective device is placed adjacent the windshield of a vehicle interiorly thereof and the third tab is inserted between the window and dash board of a vehicle and the tab on each of said protrusions is retracted against its biasing means and then released to extend between the top of the windshield and its molding, the housing is firmly held in place juxtapositioned to the windshield.

4,442,882
MACHINE FOR PRODUCING FLASKLESS MOLDS

Michael Achinger, Bgm. Ebnerstr. 20, 8904 Friedberg-Stätzling; Walter Streitenberger, Friedberg-Derching; Otto K. H. Voigt, and Hans Wolter, both of Augsburg, all of Fed. Rep. of Germany, assignors to Michael Achinger, Friedberg-Statzling, Fed. Rep. of Germany

Filed Sep. 4, 1981, Ser. No. 299,278
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1980, 3033652; Sep. 19, 1980, 3035335
Int. Cl.³ B22D 15/08
U.S. Cl. 164—187 **17 Claims**

1. A machine for producing flaskless molds having a first molding box open at both sides and a horizontally extending center line passing through the open sides, one open side of which is closable by a horizontally operating pressure piston and the opposite open side is closable by an outwardly pivotable pressing device, and in which one half of a pattern is secured to each of the pressure piston and the pressing device oriented toward one another, a stacking device onto which a completed, pressed mold body, after outward pivoting of the pressing device, is pressed horizontally all the way through the first molding box with the aid of the pressure piston, characterized in that at least one further molding box open at both sides is disposed in alignment with the first molding box between the pressure piston and the pressing device, all the molding boxes are displaceable along the center line of the molding boxes in a common, horizontal guideway, located in the direction of

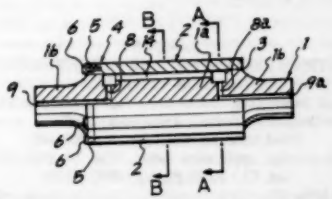


pressure and discharge, and that between each two adjacent molding boxes a pattern carrier plate is provided, the number of which is equal to the number of the molding box seams, whose cross section in a direction perpendicular to the center line corresponds to the inside cross section of the molding boxes so that said pattern carrier plate can enter into said molding boxes, each pattern carrier plate being displaceable along said center line in the pressure and discharge direction, and each carrier plate being constructed and arranged to be extracted from between the molding boxes when taken apart.

4,442,883
ROLL FOR CONTINUOUS CASTING

Yoshiaki Yamakami, Toyonaka, and Arata Yoshimitsu, Katano, both of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Mar. 9, 1982, Ser. No. 356,529
Claims priority, application Japan, Apr. 13, 1981, 56-53717[U]
Int. Cl.³ B22D 11/128
U.S. Cl. 164—448 **10 Claims**



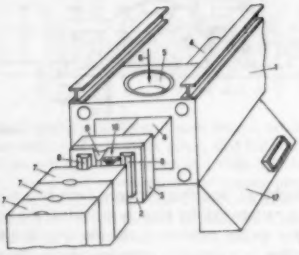
1. A roll for continuous casting comprising a roll body having a cooling water bore coaxially therewith, and a sleeve fitted around the roll body and having one end fixed to the roll body and the other end as a free end, the roll body having a trunk portion and a shaft portion at each end of the trunk portion, a plurality of cooling water channels being provided between the trunk portion and the sleeve and extending in parallel over at least ¼ the length of the sleeve axially thereof, the water channels having opposite ends in communication with the cooling water bore, the sleeve being fitted around the roll body by a shrink fit with interference values of 0.07/1000 to 3.70/1000 on one side thereof toward the fixed end and 0 to 1.50/1000 on the other side thereof toward the free end based on the outside diameter of the trunk portion, the interference value on the side toward the free end within said range being smaller than the interference value on the side toward the fixed end at all times to permit free thermal deformation of the sleeve toward the free end.

4,442,884

PROCESS AND APPARATUS FOR AUTOMATIC AND CONTINUOUS MEASUREMENT OF THE SHEARING RESISTANCE OF GREEN SAND USED IN MODERN MOLDING MACHINES

Robert Kunsch, Rueil Malmaison, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 13, 1982, Ser. No. 416,967
Claims priority, application France, Sep. 11, 1981, 81 17244
Int. Cl.³ B22D *46/00;* **B22C** *15/02, 19/00*
U.S. Cl. 164—456 **6 Claims**



1. A process for automatically measuring the shearing resistance of green sand used in a repetitive sand molding process, comprising the steps of:

introducing green sand in a first direction between opposing pattern plates of a mold press;

positioning a measuring ring on the pattern face of one of said pattern plates, said ring including a central opening and stress gauges fixed to sections of said ring, said sections being narrower than the remainder of said ring;

electrically connecting said stress gauges to electronic means for determining stresses measured by said rings;

forming a sand block in said mold press, the sand block including a sand cylinder formed in said central opening of said ring;

separating said pattern plates from the sand block to shear the cylinder from the block; and

using said electronic means to determine the shearing resistance of said sand cylinder.

4,442,885

CONTROL SYSTEM FOR AIR CONDITIONER OF MOTOR VEHICLE

Yoshitomi Matsuzaki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 12, 1982, Ser. No. 357,480
Claims priority, application Japan, Mar. 14, 1981, 56-35973
Int. Cl.³ F25B *29/00;* **H01C** *10/36*
U.S. Cl. 165—25 **4 Claims**

1. A control system for an air conditioner of a motor vehicle, comprising:

automatic control circuit means operative to enable said air conditioner to operate within a range of desired levels of heating or cooling performance thereof;

emergency circuit means operative to enable said air conditioner to operate only at the maximum level of heating or cooling performance thereof, said emergency circuit means including first and second normally closed contact means through which power is supplied to said automatic control circuit means; and

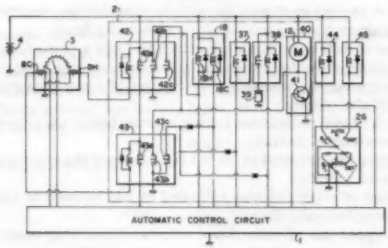
switch means connected to said automatic control circuit means and said emergency circuit means, said switch means including:

first and second fixed contact means provided in spaced relationship with each other in a first plane and electrically connected to said first and second normally closed contact means of said emergency circuit means;

third fixed elongate contact means provided intermediate between said first and second fixed contact means in a second plane disposed in substantially parallel spaced relationship with said first plane, said third fixed elongate contact means being electrically connected to said automatic control circuit means;

movable contact means carried on a rotary shaft which is spring-biased in the axial direction thereof, so that said movable contact means is normally disposed in slidable contact with said third fixed contact means, said movable contact means being arranged to be rotated with said rotary shaft about the axis of said rotary shaft so as to be selectively disposed into engagement with one of said first, second and third fixed contact means, said movable contact means being also arranged to be displaceable with said rotary shaft against said spring-bias in the axial direction of said rotary shaft; and

means provided between said first and second planes for blocking further rotation of said movable contact means beyond either end of said third fixed elongate contact means unless said movable contact means is displaced



against said spring-bias, thereby preventing said movable contact means from being unintentionally brought into engagement with either one of said first and second fixed contact means;

wherein when said movable contact means is disposed in engagement with said third fixed contact means, said automatic control circuit means is energized to enable said air conditioner to operate within said desired levels of the heating or cooling performance thereof, while said emergency circuit means is deenergized; and

wherein when said movable contact means is disposed into engagement with either one of said first and second fixed contact means while being displaced against said spring-bias, the associated one of said first and second normally closed contact means of said emergency circuit means is opened to interrupt the power supply to said automatic control circuit means so that the latter is deenergized, while said emergency circuit means is energized to enable said air conditioner to operate at the maximum level of heating or cooling performance thereof.

4,442,886

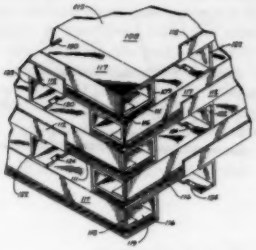
FLOATING PLATE HEAT EXCHANGER

Horia A. Disulescu, Minneapolis, Minn., assignor to North Atlantic Technologies, Inc., Bloomington, Minn.

Continuation-in-part of Ser. No. 369,279, Apr. 19, 1982. This application Apr. 6, 1983, Ser. No. 480,391
Int. Cl.³ F28F *3/10*
U.S. Cl. 165—76 **29 Claims**

1. A heat exchanger plate block providing alternating cross-flow channels for heat exchange between two fluid streams and comprising a stack of consecutive, spaced, parallel, generally rectangular plates mounted within an enclosing frame having generally rectangular end walls parallel to the plates and corner posts extending between and joining corners of the end walls, characterized by including resilient separators be-

tween said plates to render the stack of plates resiliently compressible as a unit in a direction normal to the planes of the plates, each separator having an elongated, generally flat,



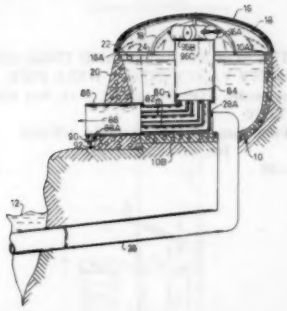
resilient spacer elastically compressible through its thickness and in operative contact with a plate, and a rigid spacer between and in operative contact with the resilient spacer and the next consecutive plate.

4,442,887

APPARATUS FOR HARNESSING WAVE MOTION AND SOLAR ENERGY AND CORIOLIS ACCELERATION OF NATURE FOR SOLAR DISTILLATION USE

Max F. Anderson, R.R. #1, Stewardson, Ill. 62463

Filed Jul. 2, 1979, Ser. No. 53,828
Int. Cl.³ F24J *3/02*
U.S. Cl. 165—85 **8 Claims**



1. In a system for obtaining air movement, the combination comprising,

a basin of water,

a solar energy-transmitting cover over said basin for heating water contained therein,

air inlet means for providing air from a location outside said system to a location beneath said cover above the surface of water in the basin,

surface type heat exchange means adjacent the bottom of said basin for cooling air passing therethrough by cooling water pumped thereto,

vertically extending air inlet passage means having an upper end terminating above the surface of the water beneath said cover in a source of air to be cooled and a lower end connected to said heat exchange means for supplying air thereto, said air inlet passage means providing communication between said heat exchange means and air source beneath said cover above the surface of the water in the basin,

air outlet passage means for the heat exchange means extending downwardly therefrom for unpumped gravity flow of cooled air downwardly through said heat exchange means from said air inlet passage means to a location outside said basin, and

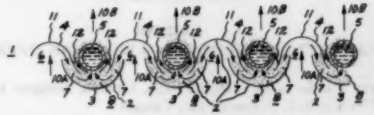
wind-operated means under the cover for operation by air flowing therebeneath.

4,442,888

FLUIDIZED PARTICLE TRAY HEAT EXCHANGER

Masayoshi Kuwata, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,817
Int. Cl.³ F28D *13/00*
U.S. Cl. 165—104.16 **6 Claims**



1. A heat exchanger system comprising:

(a) a housing;

(b) means for introducing a gas into said housing;

(c) means for removing said gas from said housing;

(d) a stage in gas flow communication with the gas introduction and removing means comprising:

(1) at least one fluidization tray unit disposed within said housing, said fluidization tray unit including at least a pair of elongated fluidization trays having upturned sides, each tray containing a shallow bed of particulate matter and being laterally disposed and spaced from each other to form a gas passage therebetween having an input in gas flow communication with said gas introduction means and an output, and an elongated fluidization tray cap disposed on said output side of said gas passage covering said upturned sides and spaced from said elongated fluidization trays to form a gas communication path between said output side of said gas passage and the volume bounded by said upturned sides; and

(2) heat transfer means for heat extraction disposed upwardly spaced, respectively, from each of said at least a pair of trays and spaced from said fluidization tray cap such that each of said heat transfer means is in heat flow communication with and immersed in the respective shallow bed of particulate matter only when the bed is fluidized, whereby only one heat transfer means is associated with each respective tray; and

(e) means for fluidizing each shallow bed of particles.

4,442,889

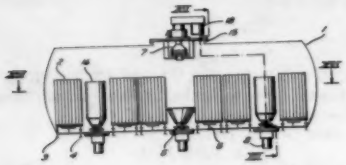
APPARATUS FOR COMBINED COOLING AND AERATION OF BIOCHEMICAL-ACTION VESSELS

Hans Müller, Im Almendli, Erlenbach/Zurich, Switzerland

Continuation of Ser. No. 966,132, Dec. 1, 1978, abandoned, which is a division of Ser. No. 837,706, Sep. 29, 1977, abandoned, which is a division of Ser. No. 559,362, Mar. 17, 1975, Pat. No. 4,073,696. This application May 22, 1981, Ser. No. 266,341
Claims priority, application Switzerland, Mar. 18, 1974, 3808/74; Sep. 10, 1974, 12389/74
Int. Cl.³ F28F *13/12*
U.S. Cl. 165—109 R **5 Claims**

1. An apparatus for cooling and aerating a substrate in a fermentation process, comprising a substantially cylindrical container elongated in a substantially horizontal direction and accommodating the substrate to be cooled and aerated; a plurality of heat-exchange sections located in said container and each including a number of parallel passages; means for advancing the substrate in said container in the direction of said passages; means for supplying gaseous aerating medium into

said passages to be entrained by the substrate advancing through the passages; and said heat-exchange sections encircling said advancing means to provide a uniform aerating and cooling of the substrate through said elongated container.

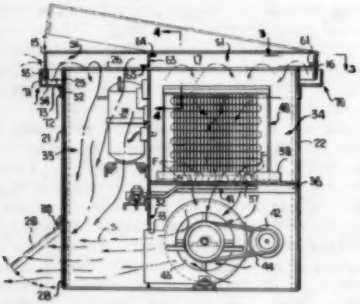


4,442,890

HEAT EXCHANGER HOUSING WITH FAN OPERATED DOOR

Gerry Vandervaart, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Filed Jun. 3, 1981, Ser. No. 269,946
Int. Cl.³ F28F 9/22
U.S. Cl. 165—124 **28 Claims**



1. A housing for a heat exchanger comprising a generally upstanding peripheral wall, partition means for setting off a pair of chambers within said housing, first means for admitting ambient air from the exterior of said housing into a first of said pair of chambers, second means for admitting air from a second of said pair of chambers to the exterior of said housing, third means for admitting ambient air from the exterior of said housing into said second chamber, means for normally closing said second air admitting means, and means for creating air flow along first and second flow paths in said respective first and second chambers and conducting air along said first flow path from said first chamber into said second chamber and thereafter directing the air toward said closing means to open said closing means and maintaining it opened under the combined effects of the air flow of both flow paths to effectively discharge air of both flow paths from said second chamber through said second air admitting means to atmosphere.

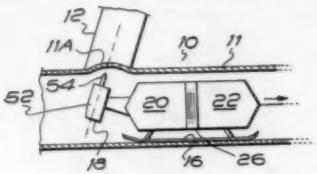
4,442,891

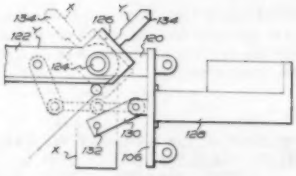
CUTTERS

Eric Wood, Northants, England, assignor to Insituform International N.V., Netherlands Antilles

Filed Mar. 1, 1982, Ser. No. 353,178
Int. Cl.³ E03F 3/06
U.S. Cl. 166—55.2 **5 Claims**

1. A cutting device, especially but not exclusively for cutting apertures in the lining of an underground pipeline or passageway, wherein said device is adapted to be located in the pipeline or passageway and includes a powered cutter bit having an axis of operation which is transverse to the pipeline or passageway axis when the cutter device is positioned therein, and cutter bit mounting means enabling the cutter bit to move bodily in an orbital path while keeping approximately the same angular relationship between the axis of operation of the cutter





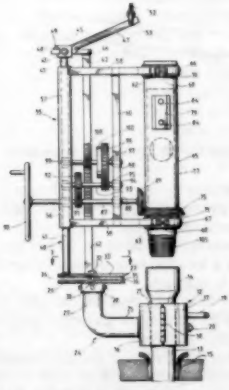
bit and the axis of a side connection or lateral where it meets the main pipeline or passageway and including adjustment means for adjusting the angle between the cutter bit axis and the axis of the pipeline or passageway.

4,442,892

APPARATUS FOR STABBING AND THREADING A SAFETY VALVE INTO A WELL PIPE

Domenico Delesandri, 3319 Delesandri, P.O. Box 428, League City, Tex. 77573

Filed Aug. 16, 1982, Ser. No. 408,443
Int. Cl.³ E21B 19/16
U.S. Cl. 166—85 **17 Claims**



1. Apparatus for use in shutting off upward flow from a conduit extending into a well, said conduit having a threaded joint at its upper end, comprising: clamp means adapted to be removably attached to said conduit adjacent and below said threaded joint; bracket means on said clamp means including a swivel base defining a vertical pivot axis that is laterally offset from and parallel to the longitudinal axis of said clamp means; an upstanding frame assembly pivotally mounted on said

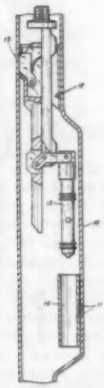
swivel base; carriage means slidably mounted on said frame assembly and movable vertically with respect thereto, tubular canister means rotatably mounted on said carriage means and adapted to house a flow control device, said carriage means, frame assembly and canister being arranged to be pivoted about said vertical pivot axis between a first position where said canister is misaligned with said conduit and a second position where the longitudinal axis of said canister is aligned with the longitudinal axes of said clamp means and conduit; and drive means for simultaneously rotating said canister and lowering the same toward said clamp means to automatically thread a flow control device into the threaded joint of said conduit, whereby the flow control device can be actuated to shut off upward flow through the conduit.

4,442,893

KICKOVER TOOL

Tommy C. Foust, Watauga, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 17, 1982, Ser. No. 349,441
Int. Cl.³ E21B *23/02*
U.S. Cl. 166—117.5 **15 Claims**



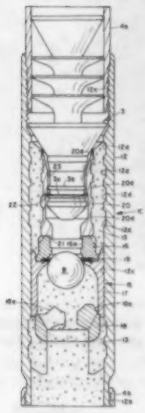
1. A kickover tool comprising,
an elongate body having a flat side and connector at its upper end,
an elongate actuator having a flat side and locator key at its upper end,
means slidably interconnecting the flat sides of said body and actuator in confronting relationship,
an arm pivoted to one of said body and actuator adjacent its lower end,
said arm having a support section,
a tool carrier pivoted to the free end of said support section of said arm,
means between said arm and the other of said body and actuator moving said arm between a position substantially coaxial with said body and a position transverse thereof, and
means releasably latching said body and actuator together in a first position with said support section extending substantially aligned with said body and in a second position with said support section extending transverse of said body.

4,442,894

UNITARY FLOAT VALVE AND WIPING PLUG RETAINER

Rudy B. Callihan, San Antonio, and Clyde Wainwright, McQueeney, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 7, 1982, Ser. No. 385,615
Int. Cl.³ E21B *33/14*
U.S. Cl. 166—156 **2 Claims**



1. A drillable cementing float valve for subterranean wells comprising: a tubular housing; means on at least one end of said housing for connection of a well conduit; a unidirectional flow valve unit having an annular housing assemblage including a cylindrical portion snugly fitting within the bore of said tubular housing and operable to permit only downward flow of cementing fluid; a sleeve mounted in said tubular housing above said valve unit; said sleeve having a depending annular flange extending into the bore of said annular housing assemblage and engagable therewith to maintain the concentricity of the sleeve with the axis of said tubular housing; means in said sleeve defining a downwardly facing, latching shoulder; and means for rigidly securing said valve unit and said sleeve within said tubular housing, whereby a conduit wiping plug may be sealingly latched to said downwardly facing latching shoulder to resist movement in one direction, said wiping plug being sealingly engaged with the bore of said sleeve.

4,442,895

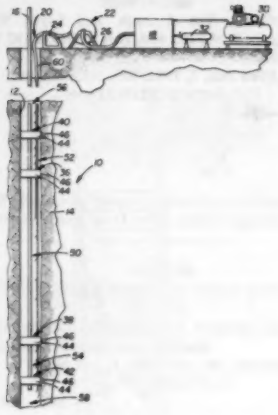
METHOD OF HYDROFRACTURE IN UNDERGROUND FORMATIONS

Peter L. Lagus, Olivenhain, and Edward W. Peterson, Del Mar, both of Calif., assignors to S-Cubed, La Jolla, Calif.

Filed Sep. 7, 1982, Ser. No. 415,538
Int. Cl.³ E21B *47/06, 47/10, 49/00*
U.S. Cl. 166—250 **10 Claims**

1. In a method for causing hydrofracture in an underground formation having a borehole extending therethrough and/or thereinto, the steps comprising
defining an isolated test interval along the borehole with at least one primary packer,
defining at least one isolated guard region at one end of the test interval with a guard packer spaced apart from the one primary packer,
filling the test interval with a selected fluid and increasing

pressure within the test interval to a level for initiating fracture of the formation surrounding the borehole, and



simultaneously and separately monitoring selected conditions such as pressure and/or flow in the test interval and guard region.

4,442,896

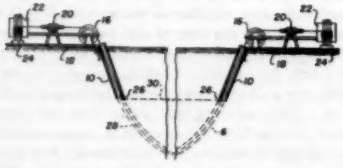
TREATMENT OF UNDERGROUND BEDS

Lucio V. Reale, 1371 Lake Ontario Dr., SE., Lake Bonavista, Clagary, Calberta, Canada, and William R. McKay, 2700 Carlton St., SW., Calgary, Alberta, Canada

Filed Jul. 21, 1982, Ser. No. 400,323

Int. Cl.[3] E21B *43/04*; E21C *25/54*

U.S. Cl. 166—278 **9 Claims**



1. A method of preparing an underground bed for treatment that comprises:

forming a channel in the bed with a drill having an attached drill string and detachably securing a cutting device to the drill string, such that said cutting device is inserted while forming the channel, the channel extending from the ground at a first point, down through the bed to a predetermined depth and up to the ground at a second point;

operating the cutting device to form a pathway in a substantially vertical plane.

4,442,897

FORMATION FRACTURING METHOD

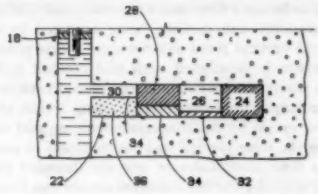
Ronald F. Crowell, Jenks, Okla., assignor to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 152,938, May 23, 1980, abandoned. This application May 13, 1982, Ser. No. 377,657

Int. Cl.[3] E21B *43/267*

U.S. Cl. 166—280 **4 Claims**

1. The method of extending a fracture in a subterranean formation, comprising injecting into a fracture in the formation through a wellbore an oil-in-water emulsion fluid at a sufficient pressure and rate to extend the fracture in said formation, followed by injecting into the fracture a cross-linked polymer gel containing a quantity of propping agents therein at a suffi-



cient pressure and rate to extend the fracture into the formation so that said fracture is lengthened and the propping agent is carried into said formation, and shutting in the wellbore.

4,442,898

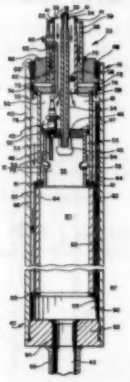
DOWNHOLE VAPOR GENERATOR

William G. Wyatt, Arlington, Tex., assignor to Trans-Texas Energy, Inc., Dallas, Tex.

Filed Feb. 17, 1982, Ser. No. 349,208

Int. Cl.[3] E21B *36/02, 43/24*

U.S. Cl. 166—303 **23 Claims**



1. A method of generating steam within a well bore with a vapor generator disposed therein of the type having a combustion chamber for heating water and the gases present in the water to produce steam and hot gases for injection into a formation adjacent the well bore, said method comprising the steps of:

delivering a combustible fuel, oxidant, and water to the vapor generator within the well bore;

mixing the fuel and oxidant within the combustion chamber of the vapor generator;

igniting the fuel and oxidant mixture within the combustion chamber and sustaining combustion therein for generating radiant heat;

flowing water around the combustion chamber and establishing a water level therein;

absorbing radiant heat from the combustion within the combustion chamber by the water flowing therearound for converting the water into steam;

providing a vent tube longitudinally disposed within the water around said combustion chamber substantially along the length thereof and disposing one end of said vent tube above said established water level;

venting gases and steam emitted by the water while being

heated around said combustion chamber through said vent tube;

discharging the steam formed from the heated water and the gases emitted by the water into a mixing region beneath the combustion occurring within the combustion chamber; and

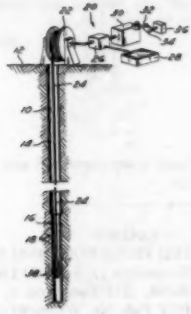
exhausting the steam and gas mixture from the vapor generator into the well bore formation.

4,442,899

HYDRAULIC JET WELL CLEANING ASSEMBLY USING A NON-ROTATING TUBING STRING

Casper W. Zublin, Bakersfield, Calif., assignor to Downhole Services, Inc., Bakersfield, Calif.

Filed Jan. 6, 1982, Ser. No. 337,371
Int. Cl.³ E21B *37/00*; B08B *9/02*
U.S. Cl. 166—312 **16 Claims**



1. A system for washing pipes, comprising:

a non-rotating tubing string;

a jet carrier attached to said string having a generally tubular body with a hollow center which provides a path for a fluid, said body having a central axis;

nozzles mounted to said carrier body;

means for supplying fluid under pressure to said nozzles, each of said nozzles being adapted to expel said fluid against said pipe with a force against the pipe, said force having an equal and opposite reactive force, one or more of said nozzles being mounted in said carrier body such that said reactive force is directionally offset from said carrier axis creating a twisting moment about said axis tending to rotate said carrier about said axis;

means for vertically moving said carrier along the length of said pipe; and

means for alternating said pressure to oscillate said carrier as it moves vertically along said pipe to clean said pipe.

4,442,900

SUBSEA WELL COMPLETION SYSTEM

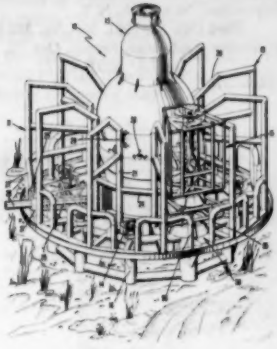
Joseph R. Padilla, Houston; Emmett M. Richardson, Duncanville, and Angelos T. Chatas, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 28, 1982, Ser. No. 343,634
Int. Cl.³ E21B *33/043*
U.S. Cl. 166—342 **35 Claims**

1. A subsea well completion system for multiple subsea wells, comprising:

a fluid-tight work enclosure hull containing manifold means, the hull having a plurality of radially-disposed lateral penetration means extending therethrough, the penetration means being operatively connected to the manifold means; and

a base template lowered to the marine floor in a substantially horizontal position and having a lower support structure for supporting the work enclosure hull, the template further having an upper guidance structure comprising a plurality of substantially vertical guide members mounted in spaced radial array, each guide member extending inwardly toward the center of the template, forming an



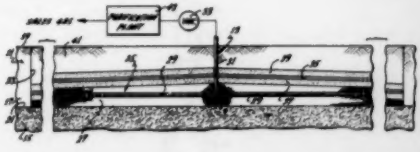
opening at the central portion of the template for receiving the work enclosure hull, a portion of the upper peripheral surface of each guide member sloping downwardly towad the opening for guiding the hull as it is lowered during installation of the hull onto the template.

4,442,901

LANDFILL GAS RECOVERY METHOD

Stanley W. Zison, Irvine, Calif., assignor to Getty Synthetic Fuels, Inc., Signal Hill, Calif.

Filed Mar. 8, 1982, Ser. No. 355,478
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—369 **31 Claims**



1. A method of collecting landfill gas from a landfill wherein the landfill gas is produced by refuse in the landfill and migrates upwardly toward the upper surface of the landfill, said method comprising:

providing a porous collector near the upper surface of the landfill with the collector including a network of apertured conduits and having a relatively broad collection zone in and generally transverse to the path of the migrating landfill gas;

placing the collector at a pressure so that at least substantial quantities of the landfill gas in said path are induced to flow into the collector;

removing the landfill gas from the collector; and

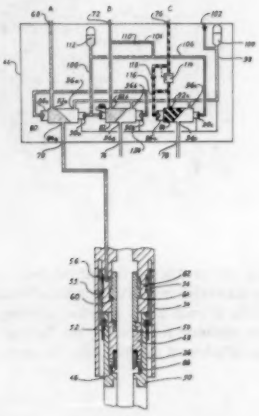
substantially preventing air from the atmosphere from being drawn into the landfill gas-producing refuse when the collector is collecting landfill gas.

4,442,902

REMOTE HYDRAULIC CONTROL METHOD AND APPARATUS, NOTABLY FOR UNDERWATER VALVES

Bernard Doremus, Echouboulains, and Jean-Pierre Muller, Cesson, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,573
Claims priority, application France, Oct. 31, 1980, 80 23656
Int. Cl.³ E21B 43/12
U.S. Cl. 166—374 7 Claims



1. A method for the remote hydraulic control of a device coupled to a hydraulic source by at least one flexible line filled with hydraulic fluid, comprising the steps of hydraulically isolating said at least one line from said device; accumulating hydraulic energy in said at least one line by increasing the pressure of said hydraulic fluid to deform said at least one line; and making available the hydraulic energy thus accumulated for rapid control of said device by remotely and controllably establishing hydraulic communication between said at least one line and said device.

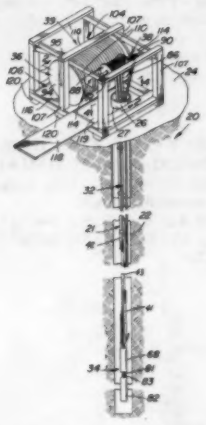
4,442,903

SYSTEM FOR INSTALLING CONTINUOUS ANODE IN DEEP BORE HOLE

William R. Schutt, R.D. 5, Curley Hill Rd., Doylestown, Pa. 18901, and Stephen R. Booth, 13835 Cherry Hollow La., Houston, Tex. 77082

Filed Jun. 17, 1982, Ser. No. 389,195
Int. Cl.³ E21B 19/08
U.S. Cl. 166—385 24 Claims

1. A system for installing an anode assembly for a cathodic protection system in a deep bore hole, said anode assembly having a first end, said system comprising reel means, support means for said reel means to enable a coiled continuous anode and at least one associated coiled component to be unreeled into said bore hole together as a single assembly, and weight means secured to said assembly adjacent its first end for assisting in the carrying of said component and said anode to the bottom of said bore hole.

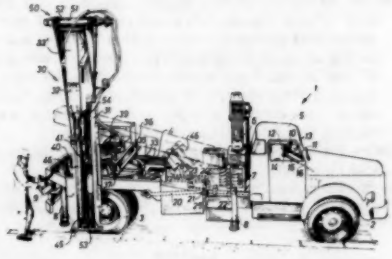


4,442,904

VEHICLE MOUNTED HOLE FORMING MACHINE

Gustav H. O. Wibom, Skogsvägen 12, S-181 41 Lidingö, Sweden

PCT No. PCT/SE79/00244, 371 Date Aug. 1, 1980, 102(e) Date Jul. 24, 1980, PCT Pub. No. WO80/01154, PCT Pub. Date Jun. 12, 1980
PCT Filed Nov. 30, 1979, Ser. No. 204,402
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1978, 7812412
Int. Cl.³ E21C 11/02
U.S. Cl. 173—28 2 Claims



1. In a vehicle of the type having a rear floor, a front driving cabin, main drive means for driving the rear wheels of the vehicle, and main steering means for controlling the front wheels of the vehicle, wherein said main drive means and said main steering means are operated from said driving cabin, the improvement comprising a stationary turn plate mounted on said rear floor adjacent the rear end of said vehicle, a pair of parallel spaced apart guide means carried by said turn plate for rotation on said turn plate, slide means mounted for horizontal reciprocating movement in said guide means, a working machine having an elongated support frame, first horizontal pivot means connecting said support frame to said slide means whereby said support frame may be pivoted between a substantially vertical position and a horizontal position overlying said vehicle with the lower end of said support frame directed forwardly of the vehicle, second horizontal pivot means dis-

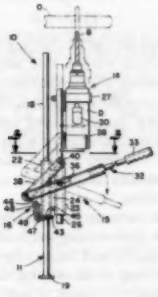
posed orthogonal to said first horizontal pivot means for pivotally connecting said support frame to said slide means, hammer means arranged to be moved vertically along said support frame, hydraulic means for moving said hammer means, a drift member carried by said hammer means, a casing tube surrounding said drift member, winch means having a line disposed on both sides of said hammer means and connected to said casing tube for lifting said casing tube, and means on said line being arranged to co-act with said hammer means in a manner such that when such hammer means is lifted vertically, said hydraulic means assists in lifting said casing tube, thereby relieving strain on said winch means.

4,442,905

JIG ASSEMBLY FOR DRILLING VERTICALLY UPWARD

Edward E. Agoston, 11535 Dunham Rd., Sagamore Hills, Ohio 44067

Filed Aug. 6, 1981, Ser. No. 290,682
Int. Cl.³ E21C *11/00*
U.S. Cl. 173—36 **12 Claims**



1. A portable jig assembly for supporting a power drill and for advancing and retracting the drill towards and away from an overhead workpiece to drill a hole therein, comprising an upright standard, a carriage mounted for vertical movement on said standard, a drill holder mounted on said carriage for vertical movement relative to said carriage, said holder being adapted to support a power drill for movement therewith, feed means on said carriage and cooperative with said holder to advance and retract the holder so that a drill supported by said holder may be caused to drill a hole in the workpiece and thereafter be removed from the workpiece, releasable lock means in cooperative relation with said carriage and standard for preventing downward movement of said carriage on said standard while permitting upward movement of said carriage on said standard whereby said carriage may be selectively positioned on said standard by lifting same and then released to lock same in place, and means for releasing said releasable lock means to permit downward movement of said carriage, said feed means including means cooperative with said means for releasing to effect release of said releasable lock means upon retraction of said drill holder.

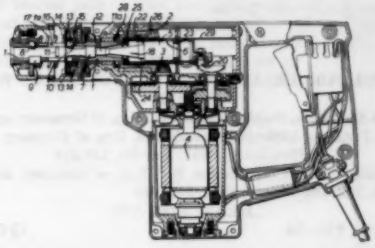
4,442,906

PERCUSSIVE DRILLS

Frank F. Simpson, Middlesex, England, assignor to Black & Decker Inc., Newark, Del.

Filed Nov. 17, 1981, Ser. No. 322,389
Claims priority, application United Kingdom, Nov. 18, 1981, 8036916
Int. Cl.³ E02D *7/02*
U.S. Cl. 173—48 **13 Claims**

1. A percussive drill, comprising:
a bit holder;
a percussive drive including a ram slidably mounted in a hollow piston;
drive means for reciprocating the ram in the piston via an air cushion formed between said piston and said ram, the forward travel of the ram during percussive action of the drill being limited by a drill bit or an intermediate member interposed between the drill bit and the ram;
a resilient annular hollow-section member for holding the ram, when percussive action is not desired, in a position further forward than the forward travel to which the ram is limited during percussive action;



said resilient annular hollow-section member being entered by the ram as the latter moves to said position further forward and the ram forming a seal with said hollow-section member, the latter also absorbing the energy of an impact by the ram thereagainst; and
said piston having a forward portion of wider internal cross-section than a rear portion of said piston and in which rear portion said ram reciprocates during percussive action of the drill, and said ram being located fully in said forward portion in said position further forward whereby the air cushion between the piston and the ram is vented.

4,442,907

APPARATUS FOR STRINGING WELL PIPE OR CASING

John L. Sexton, R.D. 2, New Concord, Ohio 43762

Filed Aug. 16, 1982, Ser. No. 408,113
Int. Cl.³ E21B *19/16*
U.S. Cl. 173—164 **3 Claims**

1. An apparatus for stringing a plurality of threaded pipe to one another in a vertical configuration within a deep well bore comprising, in combination; a conventional well drilling apparatus including a vertically movable platform carrying a rotary drive means; a drive spindle removably mounted to said rotary drive means and including a pair of opposed lugs extending outwardly at right angles to the length of said spindle and a centering guide means at the lower end of said spindle; a friction collar means adapted for removable mounting to a conventional coupling member mounted on the end of a conven-

tional length of pipe, said collar means including a generally cylindrical body portion having an inner diameter larger than the outer diameter of said coupling member, a plurality of adjustable gripping means disposed within said collar means and inwardly movable for frictional engagement with said coupling member, and a pair of ears fixed to the walls of said body and extending vertically beyond the upper portion of said body for cooperative engagement with said lugs on said drive spindle when said centering guide means on said drive spindle is disposed within said coupling member of a length of pipe which is positioned to be added to the pipe string to transfer rotational torque of said rotary drive means to the pipe engaged by said collar means.

4,442,908

TOOL FOR DRILLING CURVED SECTIONS OF WELL HOLES

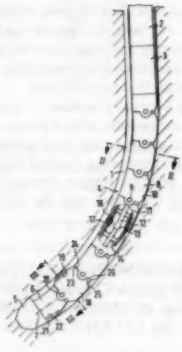
Arno Steenbock, Barsinghausen, Fed. Rep. of Germany, assignor to Preussag Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 8, 1981, Ser. No. 281,334

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1980, 3026559; Mar. 3, 1981, 3107973

Int. Cl.³ E21B *7/08*

U.S. Cl. 175—74 **13 Claims**



1. A drilling tool for drilling curved sections of deep well holes by means of a drill bit operated by a downhole drive disposed at the downhole end of a drill pipe string which is secured against rotation, the angular deviation of the drill bit from the well axis being controlled by said drill pipe string, characterized in that a segment of the drill string is flexible in one plane only and comprises a series of generally-tubular individual link members pivotally connected to each other by means of pins, the next to the last link member of the downhole end of said drill string having a width dimension equal to the diameter of the drill bit, and means on the last link member of the drill string for controlling the pivotal position of said last member with respect to the penultimate member, said last member being located immediately adjacent the drill bit and forming a pivot bearing for said drill bit.

4,442,909

DRILL BIT

Robert P. Radtke, Kingwood, Tex., assignor to Strata Bit Corporation, Houston, Tex.

Filed Sep. 21, 1981, Ser. No. 303,960

Int. Cl.³ E21B *10/46*

U.S. Cl. 175—329 **3 Claims**

1. A drill bit comprising

a drill body having a hollow tubular body adapted to be connected to a drill string,

said drill body having an exterior peripheral stabilizer surface and an end cutting face,

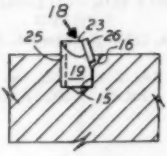
said end cutting face having a plurality of cylindrical recesses spaced therearound in a selected pattern,

each of said recesses having a milled offset recess at its surface opening edge, of circular curvature in section and intersecting the circumferential edge of said recess for substantially less than 180° of the circumference thereof,

said milled offset recesses each being of circular cross section taken longitudinally of the cutting element recess and circular cross section taken normal thereto,

a plurality of cutting elements, one for each of said recesses,

said cutting elements each comprising a cylindrical support-



ing stud of sintered carbide having an angularly oriented supporting surface with a disc shaped element bonded thereon comprising a sintered carbide disc having a cutting surface comprising polycrystalline diamond,

each of said cutting elements being positioned in one of said recesses by an interference fit with said disc shaped element partially recessed in and having the lower edge thereof continuously abutting the curved surface of said milled offset recess,

said milled offset recesses each being positioned to orient said discs with their cutting surfaces facing the direction of rotation of the bit and being of a size relieving stresses on said supporting studs during cutting operation and resisting twisting movement of said studs.

4,442,910

COMBINATORIAL WEIGHING APPARATUS

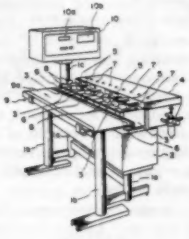
Yoshiharu Mikami, Kyoto, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 16, 1982, Ser. No. 368,915

Claims priority, application Japan, Apr. 23, 1981, 56-59322[U]

Int. Cl.³ G01G *19/22, 19/00*; B65G *25/04*

U.S. Cl. 177—25 **8 Claims**



1. A combinatorial weighing apparatus for combining weight values of articles not suitable for distributive supply respectively manually placed, selecting a combination of the articles having weight equal or closest to a target weight and delivering the selected articles, said apparatus comprising:

a plurality of juxtaposed closely spaced weighing machines each having a bowl for receiving the manually placed articles;

pushing members which can move frontward and backward

on the respective closely spaced bowls of the plurality of juxtaposed weighing machines;

a driving unit which selectively moves the pushing members frontward and backward, said pushing members corresponding to the weighing machines with selected batches of the articles placed thereon, said driving unit comprising:

electromagnetic valves, air cylinders coupled to said valves and having piston rods attached to said pushing members which are respectively disposed in correspondence with said weighing machines; and

a driver circuit which drives the electromagnetic valves corresponding to said weighing machines with said selected batches placed thereon, and selected ones of said electromagnetic valves are energized, thereby to extend and contract the piston rods connected to said air cylinders and to move said pushing members frontward and backward; and

a conveyor which is disposed along the juxtaposed weighing machines and which conveys said batches of the articles delivered by said pushing members.

4,442,911

METHOD AND APPARATUS FOR CONTROLLING ZERO ADJUSTMENT OF WEIGHT SENSOR

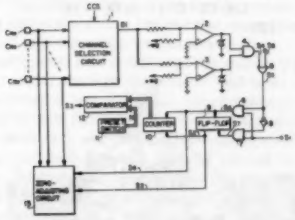
Masao Fukuda, Shiga, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Mar. 12, 1982, Ser. No. 357,755

Claims priority, application Japan, Mar. 14, 1981, 56-37061

Int. Cl.³ G01G *23/14, 19/22, 23/18*

U.S. Cl. 177—165 **10 Claims**



1. A method of controlling the zero adjustment of weight sensors for measuring the weight of articles, comprising the steps of:

discriminating whether the zero point deviation of each weight sensor lies within preset allowed limits;

applying a zero adjustment to each weight sensor when the zero point deviation thereof lies within said allowed limits and generating a signal for inhibiting the zero adjustment when the respective weight sensor zero point deviation lies outside of said allowed limits;

counting a number of times the zero adjustment inhibit signal is generated; and

comparing the counted value with a predetermined value and producing an alarm signal when said counted value and said predetermined value coincide.

4,442,912

TILT-CAB TRUCK INCLUDING APPARATUS TO SECURE UNIFORM ADVANCE AND RETRACTION OF THE TILT CYLINDERS

Friedrich Vette, Holland, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Jul. 13, 1982, Ser. No. 397,682

Int. Cl.³ B62D *33/06;* **F15B** *11/05, 13/02, 20/00*

U.S. Cl. 180—89.15 **3 Claims**

1. A tilt-cab truck comprising:

(a) a chassis;

(b) a cab mounted on said chassis and pivotable with respect to said chassis about an axis;

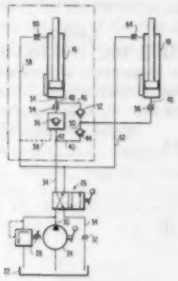
(c) first and second hydraulic jacks for tilting said cab about said axis back and forth between a lowered first position and a raised second position;

(d) a control valve for selectively applying hydraulic fluid to the push sides of said hydraulic jacks;

(e) a first path of fluid communication connecting said control valve to the push side of said first hydraulic jack;

(f) a pilot-operated check valve disposed in said first path of fluid communication between said control valve and the push side of said first hydraulic jack;

(g) a second path of fluid communication connecting the push side of said second hydraulic jack to said first path of fluid communication at a first point between said control valve and said pilot-operated check valve;



(h) a first check valve disposed in said second path of fluid communication, said first check valve permitting flow towards the push side of said second hydraulic jack but preventing flow in the opposite direction;

(i) a third path of fluid communication connecting said first path of fluid communication at a second point between said pilot-operated check valve and the push side of said first hydraulic jack to said second path of fluid communication at a third point between said first check valve and the push side of said second hydraulic jack; and

(j) a second check valve disposed in said third path of fluid communication, said second check valve permiting flow towards the push side of said first hydraulic jack but preventing flow in the opposite direction.

4,442,913

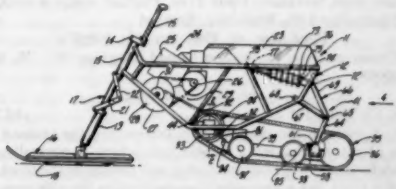
SNOW VEHICLE

James E. Grinde, Anoka, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed Feb. 8, 1982, Ser. No. 346,945

Int. Cl.³ B62M *27/02*

U.S. Cl. 180—190 **10 Claims**



1. A small, lightweight snow vehicle having frame means, a front ski supported for steering movement about a steering axis by said frame, an endless drive belt disposed to the rear of said front ski, power means including a driving connection for

driving said driving belt, the input to said driving belt from said power means being positioned at the forwardmost portion of said driving belt, suspension means for suspending said driving belt for suspension movement relative to said frame means, said suspension movement including a component that is pivotal about a horizontal, transverse axis disposed adjacent the forwardmost portion of said driving belt whereby the driving portion of said driving belt assumes different angles relative to the terrain in response to different degrees of suspension travel, said suspension means further including means for permitting pivotal movement of said frame means relative to said driving belt about a longitudinally extending axis for leaning of said frame means relative to said driving belt without affecting the contact area between said driving belt and the terrain over which said vehicle is travelling, said front ski having a runner no greater than 8 inches in width, and said driving belt having a width no greater than 10 inches.

4,442,914

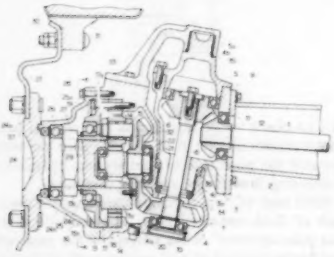
FRONT WHEEL DRIVING DEVICE OF VEHICLE

Tadao Nishihara, Department of Technology, Iseki & Co., Ltd. 588-1, Doitacho, Matsuyama-shi, Ehime-ken, Japan

Filed Sep. 13, 1982, Ser. No. 417,333

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—255 **6 Claims**



1. A front wheel driving device for vehicles comprising: a front axle housing accommodating a front wheel driving shaft; an inner gear case attached to an outer end of the front axle housing; an outer gear case fitted to the inner gear case for free steering rotation; a planetary gear mechanism adapted to be driven by said front wheel driving shaft through a bevel gear mechanism and supported by an intermediate seat adapted to be fitted in the outer gear case; and a front wheel axle to which a front wheel is secured and supported by a cover, the front wheel axle being adapted to fit an output shaft of the planetary gear mechanism when the cover is coupled to an outer end of the outer gear case.

4,442,915

VEHICLE CONTROL APPARATUS

James Steel, Newcastle Upon Tyne, England, assignor to Ogden Electronics Ltd., Yorkshire, England

Filed Mar. 31, 1981, Ser. No. 249,636

Claims priority, application United Kingdom, Sep. 25, 1980, 8030905

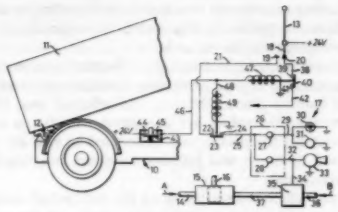
Int. Cl.³ B60T *7/12*

U.S. Cl. 180—271 **1 Claim**

1. Apparatus for automatically controlling the braking system of a truck having a tiltable bed which is normally in a predetermined rest position during safe motion of the truck and which truck has a gear selection mechanism for effecting motion of the truck, said apparatus comprising:

detection means for detecting a first condition when said tiltable bed is removed from its safe rest position and a second condition when said gear selection mechanism is placed in a gear for effecting motion of the truck and for producing a control output in response to concurrent detection of the first and second conditions;

timing control means for producing a time-delayed control signal in response to a continuation of said control output after a predetermined elapsed time interval from the time when said control signal is initially produced so as to thus



allow the truck to effect motion for the duration of such an elapsed time interval; and

automatic brake actuation means connected to respond to said time-delayed control signal by automatically actuating the braking system of the truck and thus retarding its further motion.

4,442,916

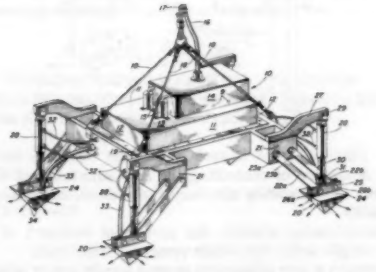
UNDERWATER SHEAR WAVE VIBRATOR COUPLING

Delbert W. Fair, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Dec. 4, 1980, Ser. No. 212,937

Int. Cl.³ G01V *1/14, 1/38*

U.S. Cl. 181—120 **17 Claims**



1. An underwater shear wave vibrator apparatus for generating a shear wave force into a seabed, said vibrator including a housing having sidewalls, a top and a bottom, a vibratory generating means mounted inside said housing for generating a force along an axis substantially parallel to said seabed surface and a seabed engagement means having an attachment surface and an underside surface for engaging said seabed, an improvement in attaching said seabed engagement means to said housing comprising:

(a) arm means;

(b) means for pivotally attaching said arm means at one end to said housing and pivotally attaching the other end to said attachment surface of said seabed engaging means;

(c) means for positioning said seabed engaging means normal to the force axis of said vibratory generating means by movement about said pivotal attachment to maintain contact of said seabed engagement means with said seabed as said vibratory generating means is applying force against said seabed; and

(d) sensing means for maintaining the orientation of said

underside surface as said positioning means moves said seabed engaging means.

4,442,917

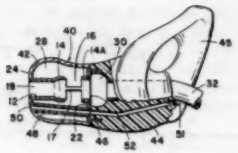
VENTED ACOUSTIC EAR MOLD FOR HEARING AIDS

Rubein V. Johnson, 2432 Court St., Muskogee, Okla. 74401

Division of Ser. No. 226,030, Jan. 19, 1981. This application Sep. 30, 1982, Ser. No. 429,037

Int. Cl.³ A61B 7/02

U.S. Cl. 181—135 **8 Claims**



1. In a hearing aid ear mold insertable into the auditory canal of the user and having a longitudinal conduit for the passage of sound wave energy from a hearing aid to the tympanic membrane of the ear, the improvement comprising a metal structure having:

(a) an inner central thin-walled metal tube forming said longitudinal conduit, connected at its outer end by tubular means to said hearing aid, the inner end inserted into the ear;

(b) an outer thin-walled metal tube coaxial with said inner central tube, and forming a first annular space closed by annular end walls sealing the annular space between said inner and said outer thin-walled metal tube;

(c) said inner metal tube constructed by cutting a groove of selected width through the wall of said inner tube near one end forming two portions, a long portion on the inner end, toward said tympanic membrane, and a short portion on the outer end; and including at least one slender post holding said two portions in fixed coaxial and spaced relation, whereby the opening between the space in said conduit and in said first annular space is a narrow circumferential gap forming a first resonance chamber.

4,442,918

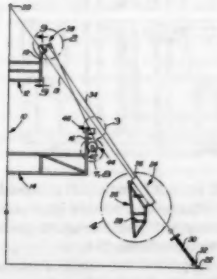
EMERGENCY ESCAPE DEVICE

Gerald A. Rhoads, Sr., Yuma, Ariz., assignor to X-Pert Well Service, Inc. and Gerald A. Rhoads, Jr., both of Hobbs, N. Mex., a part interest

Filed Jun. 15, 1983, Ser. No. 504,584

Int. Cl.³ A62B 1/02, 1/12

U.S. Cl. 182—10 **16 Claims**



1. An escape device for allowing an endangered person to be lowered from an elevated structure in the event of an emergency, the escape device comprising in combination;

a. an escape cable having an upper end secured to the elevated structure and a lower end secured to an anchor remote from the elevated structure, said escape cable extending at an angle to the vertical;

b. a trolley assembly including a seat for supporting the endangered person to be lowered from the elevated structure, said trolley assembly also including at least one pulley for engaging said escape cable and suspending said seat therefrom for allowing said seat to descend the escape cable by rolling downwardly therealong;

c. braking means extending between the elevated structure of said trolley assembly for automatically regulating the descent of said seat along said escape cable, said braking means permitting the initial rate of descent of said seat along said escape cable to be relatively rapid for removing the endangered person from the site of the emergency and automatically causing the rate of descent of said seat to decrease as said seat approaches the lower end of said escape cable.

4,442,919

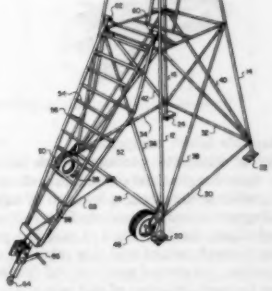
PORTABLE TOWER

Rodney D. Fulcher, 2039 Brookhollow, Abilene, Tex. 79605

Continuation of Ser. No. 291,562, Aug. 10, 1981, abandoned. This application Aug. 17, 1983, Ser. No. 524,461

Int. Cl.³ E04G 1/00

U.S. Cl. 182—63 **8 Claims**



1. A portable tower for transport between erection sites behind a tow vehicle, said tower comprising:

a tower assembly including support leg means for supporting said tower in an erect position, said support leg means including means at a base of seid support leg means for engagement with the ground when said tower is in said erect position;

tower transport wheels mounted on said tower assembly at substantially the end of said tower including said base of said support leg means; and

an elongated tongue assembly pivotally connected at one end of said tongue assembly to said tower assembly at a pivot point on said tower assembly which is spaced from and above the axes of rotation of said transport wheels when said tower is in said erect position, said tongue assembly including means at its other end for coupling said tongue assembly to said tow vehicle for towing said tower in a substantially reclined transport position, said tower assembly including means engageable with said tongue assembly upon movement of said tower assembly to said transport position from said erect position whereby said tower assembly is supported in said transport position

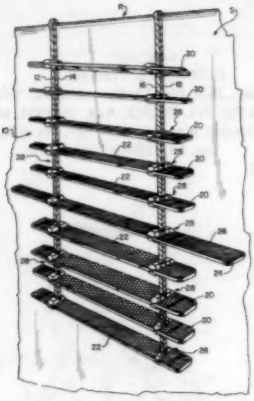
by said tongue assembly and said transport wheels and whereby said tongue assembly is supported by and between said tow vehicle and said tower assembly during transport of said tower, the spacing of said pivot point in relation to the axes of rotation of said transport wheels being sufficient to provide for movement of said tower assembly toward said erect position by exerting a tower erecting force on said tongue assembly to pivot said tower about said pivot point and with respect to said tongue assembly to said erect position.

4,442,920

COLLAPSIBLE LADDER

Peter W. Gronbeck, Highlands; Dennis Mullaney, Belford, and Kimberly M. Smith, Colts Neck, all of N.J., assignors to Steelstran Industries, Incorporated, Matawan, N.J.

Filed Sep. 30, 1982, Ser. No. 430,593
Int. Cl.³ E06C 1/56
U.S. Cl. 182—199 **18 Claims**



1. A collapsible ladder comprising:

a plurality of elongated platforms each having a pair of spaced apart longitudinal side edges and a pair of spaced apart transverse end edges, a first pair of adjacent notches being disposed in each of said platforms adjacent to one of said end edges, the first notch of said first pair of notches opening through one of said side edges of the associated said platform, the second notch of said first pair of notches opening through the other of said side edges of the associated said platform, a second pair of adjacent notches being disposed in each of said platforms adjacent to the other of said end edges, the first notch of said second pair of notches opening through one of said side edges of the associated said platform, the second notch of said second pair of notches opening through the other of said side edges of the associated said platform;

a plurality of rope segments extending between said elongated platforms for supporting said platforms in a spaced apart use position, selected portions of selected rope segments being disposed in said first and second pairs of notches; and

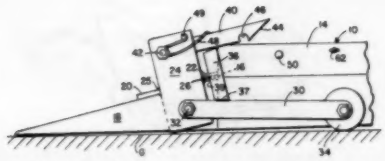
a plurality of clamp means, some of said clamp means for clamping said selected portions of said selected rope segments in said first pairs of notches, the balance of said clamp means for clamping selected said rope segments in said second pairs of notches, each of said clamp means being divided into two halves, a rope engaging portion of each half of each of said clamp means being dimensioned for at least a portion thereof to reside within the corresponding said notch, each of said clamp means including means for securing the halves thereof together to wedge said selected portions of said rope segments between said rope engaging portions of said clamp means and said elongated platforms.

4,442,921

LIFT PLATFORM AUTOMATIC RAMP BARRIER

William D. Sherman, Upper Sandusky, Ohio, assignor to REB Manufacturing, Inc., Carey, Ohio

Filed Feb. 23, 1981, Ser. No. 236,838
Int. Cl.³ B60S 13/00
U.S. Cl. 187—8.52 **26 Claims**



1. A safety barrier for a platform lift comprising:

(A) a vertical movable platform having an exposed edge,

(B) a barrier means hinged along said edge of said platform,

(C) means for urging and maintaining said barrier means into its barrier position, said maintaining means comprising a latch means between said barrier means and said platform, and

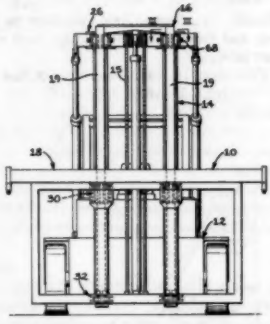
(D) a single lever member directly pivotally attached, for limited movement, at one of its ends to said barrier means and having a ground-engaging means on its other end for moving said barrier means into its non-barrier position, said lever member including means for abutting said latch means for releasing said latch means when said other end of said lever member engages the ground.

4,442,922

ADJUSTABLE SLIDER BEARING ASSEMBLY

Richard J. Johannson, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio

PCT No. PCT/US81/00330, 371 Date Mar. 16, 1981, 102(e) Date Mar. 16, 1981, PCT Pub. No. WO82/03215, PCT Pub. Date Sep. 30, 1982
PCT Filed Mar. 16, 1981, Ser. No. 277,749
Int. Cl.³ B66B 9/20
U.S. Cl. 187—9 E **9 Claims**



1. A lift mast (**10**) for a lift truck (**12**) comprising:

a support frame (**14**) attached to said lift truck (**12**);

an upper upright-support frame support assembly (**26**) attached to said support frame (**14**);

a lower upright-support frame support assembly (**28**) attached to said support frame (**14**);

an upright assembly (**16**) retained by said upper and lower

upright-support frame support assemblies (26,28), said upright assembly (16) having at least one I-beam (19), said I-beam having flanges (21,22) and a web (24), said web (24) having opposite sides and said upright assembly (16) being longitudinally movable through said support assemblies (26,28);

a carriage (18);

an upper upright-carriage support assembly (30) attached to said carriage (18) and connecting said carriage (18) to said upright assembly (16);

a lower upright-carriage support assembly (32) attached to said carriage (18) and connecting said carriage (18) to said upright assembly (16);

at least one of said support assemblies (26,28,30,32) having two slider bearings (36), one of said two slider bearings contacting one of said flanges (21,22) on one side of said web (24) and the other of said two slider bearings (36) contacting said one flange (21,22) on the other side of said web (24), said slider bearings (36) each being supported by a fulcrum (68).

4,442,923

AUTOMATIC REGULATOR FOR INTERNALLY EXPANDING DRUM BRAKE

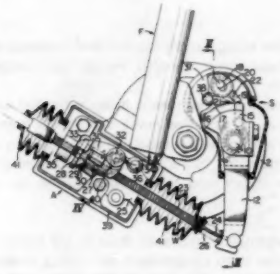
Goroei Wakatsuki, Fujimi, and Sadashi Yamamoto, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1981, Ser. No. 283,618

Claims priority, application Japan, Jul. 18, 1980, 55-98316; Jul. 18, 1980, 55-98315

Int. Cl.³ F16D 65/56

U.S. Cl. 188—79.5 K 7 Claims



1. An automatic regulator for an internally expanding drum brake comprising in combination: a brake drum rotatable with a rotary shaft and having a brake surface; a stationary brake panel; a pair of brake shoes housed in said brake drum and mounted on said stationary brake panel for outwardly expanding movement in a brake applying operation and inward return movement in a brake releasing operation; a brake cam rotatably interposed between opposed free ends of said first and second brake shoes and being rotatable to outwardly expand said first and second brake shoes toward said brake surface of said brake drum for frictional engagement in said braking operation; a brake lever secured to said brake cam; a stationary support member; a brake wire means connected to said brake lever, said brake wire means comprising an externally threaded outer wire member supported by said stationary support member for axial movement relative thereto, and an inner wire member inserted through said outer wire member and connected to said brake lever; a return spring for urging said brake shoes in a contracting direction; stopper means for controlling a return angle of said brake lever to be constant upon a brake releasing operation; and a regulating means for automatically regulating an amount of play of said brake wire to be constant in response to one of said operations, said regulating means comprising a biasing means for biasing said outer wire member in a direction away from said brake lever, an adjusting nut movably supported on said stationary support member and threaded on said outer wire member, and a nut-turning means on said stationary support member for turning said adjusting nut relative to said outer wire member in response to said one brake operation to axially displace said outer wire member relative to said inner wire member for adjustment of the relative position between said outer and inner wire members when the brake is not operated.

4,442,924

INTERNAL SHOE DRUM BRAKES

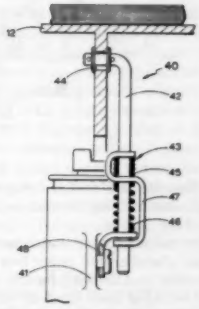
Harold Hodkinson, Coventry, and William E. Haines, Southam, both of England, assignors to Automotive Products Limited, Leamington Spa, England

Continuation of Ser. No. 314,868, Oct. 26, 1981, abandoned. This application Jul. 6, 1983, Ser. No. 511,001

Claims priority, application United Kingdom, Oct. 29, 1980, 8034841

Int. Cl.³ F16D 65/54

U.S. Cl. 188—79.5 GT 5 Claims



1. An internal shoe drum brake having:

a drum;

a back plate;

a pair of brake shoes mounted on the back plate;

a pair of double ended expanders each mounted on the back plate so that its operating axis is substantially vertical, said expanders each being located between adjacent ends of said shoes so that one of said shoes is above the expanders and the other of said shoes is below the expanders;

adjustment means in one of said expanders for maintaining a constant shoe to drum clearance;

a strut assembly located in one of said expanders and being slidable therein to transmit braking loads from one brake shoe to the other;

return springs interconnecting the shoes to pull the shoes against the expanders; and

a variable length support means having one connection with a position fixed relative to the back plate and another connection with the upper brake shoe near to said one of the expanders, said support means comprising a strut connected at one end to one of said connections, a friction grip device encircling the strut and having frictional engagement therewith, a stop member connected to the other of said connections, a bracket member having one end portion, another end portion and a central portion, each of said portions being slidable on the strut, a compression spring encircling the strut and arranged between said central portion and the stop member and biasing said one end portion against the stop member, the friction grip device being arranged between said central portion and said other end portion, the arrangement being such that the strut can move in one direction through the friction grip device to elongate said support means and allow the

upper brake shoe to maintain a fixed shoe to drum clearance but under braking loads which tend to shorten said support means the compression spring collapses and the strut does not move in the other direction through the friction grip device.

4,442,925

VORTEX FLOW HYDRAULIC SHOCK ABSORBER

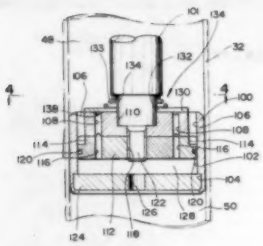
Naoto Fukushima, Fujisawa; Kazuroh Iwata, Kamakura; Kunihiko Hidaka, and Keiichiro Yabuta, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Sep. 3, 1981, Ser. No. 299,155

Claims priority, application Japan, Sep. 12, 1980, 55-129926[U]

Int. Cl.³ F16F 9/19

U.S. Cl. 188—282 **9 Claims**



1. A vortex flow shock absorber comprising:

a hollow cylinder defining therein a fluid chamber filled with a working fluid;

a piston reciprocally disposed within said fluid chamber and dividing said chamber into upper first chamber and lower second chamber and defining therein a vortex chamber in which said working fluid flows in vortex fashion to produce an absorbing force;

first fluid passage means for establishing communication between one of said first and second chambers and said vortex chamber, which first fluid passage means extends through one of horizontal sections of said piston and having an inner end tangentially opening to said vortex chamber on the horizontal periphery of the vortex chamber for discharging the fluid into said vortex chamber in vortex fashion;

said fluid passage means for communication between the other fluid chamber and said vortex chamber.

4,442,926

SIMPLIFIED HYDRAULIC DAMPER

Toshiaki Muto, Kamakura, Japan, assignor to Tokiko Kabushiki Kaisha, Japan

Continuation of Ser. No. 269,596, Jun. 2, 1981, abandoned. This application Jul. 25, 1983, Ser. No. 516,864

Claims priority, application Japan, Jun. 6, 1980, 55-79038[U]

Int. Cl.³ F16F 9/19

U.S. Cl. 188—317 **14 Claims**

1. A hydraulic damper comprising:

a tube with a bottom end thereof closed and defining a working space therein;

a piston slidably movable within the working space of the tube and dividing the working space into upper and lower chambers which are at least partially filled with hydraulic fluid;

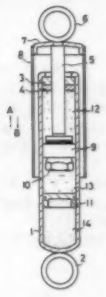
a piston rod, the piston secured to an end thereof by a hollow nut having a cavity therein opening toward the lower chamber, such that the piston is disposed between the piston rod and the hollow nut, the other end of the piston rod extending outside the tube through a rod guide and a sealing member which are fitted to a mouth end of the tube and which serve to guide the piston rod and maintain the sealing engagement among the tube, the piston rod and the sealing member;

a first communication path provided in the piston through the thickness of the piston to communicate the upper and lower chambers therethrough;

a second communication path comprised of the cavity in the hollow nut and a hole bored in the piston rod, one end of the hole being opened to the upper chamber and the other end being opened to said cavity;

first and second damping valve means adapted to open and close the first and second communication paths respectively;

said second damping valve means being located within the cavity of said hollow nut and comprising a disc valve, a valve seat, and a screw member;



said disc valve being fixedly sandwiched between said valve seat and said screw member within said cavity of said hollow nut;

said first damping valve means being provided in the first communication path and being adapted to communicate the upper and lower chambers in a contraction stroke;

said second damping valve means being adapted to communicate the upper and lower chambers in an extension stroke;

and

means for urging the hydraulic fluid in the lower chamber upwardly so as to compensate the varied volume of the piston rod within the tube as the piston rod enters or retracts from the tube, said means being located adjacent to the lower chamber.

4,442,927

CARRIER FOR GARMENT BAGS AND THE LIKE

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Filed Apr. 22, 1982, Ser. No. 370,855

Int. Cl.³ A45C 5/14, 13/04

U.S. Cl. 190—18 A **2 Claims**

1. In combination with a generally rectangular elongated garment bag adapted to be folded on itself along a transverse fold line, a carrier for said bag comprising:

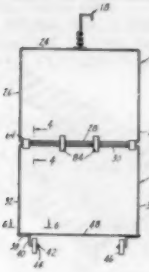
a frame within said bag for stiffening the lower folded portion of said bag,

said frame including a pair of elongated side members extending along the longitudinally extending side edges of said bag and a transversely extending central member adjacent the upper end of said lower portion of said bag,

a bearing fixedly secured to said bag adjacent said fold line for swingable supporting said central member, said central member being split at a point within said bearing,

the lower end wall of said bag being apertured to receive said side members therethrough,

said side members being bent to form a pair of horizontally extending terminal portions external of said bag, and



a pair of ground wheels rotatably supported on said terminal portions.

4,442,928

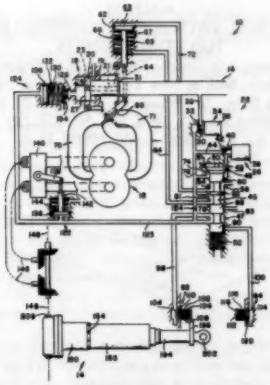
ACTUATOR

James M. Eastman, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Oct. 2, 1981, Ser. No. 307,737

Int. Cl.³ B60K *41/20*; F16D *71/00, 7/02*

U.S. Cl. 192—3 N **17 Claims**



1. In an actuator having a housing with a bore therein, a shaft located in said bore, a nut carried on said shaft and rotationally restrained in said bore, an input member, an output member connected to said nut, and a linkage member for connecting said input member to said shaft, said linkage member transmitting a rotary torque from the input member to said shaft causing said nut to move in said bore and provide said output member with linear movement, said linkage being characterized by a drive member connected to said input member, a driven member connected to said shaft by a torsionally flexible member and an axially resilient member for urging said driven member into engagement with said drive member, said torsionally flexible member transferring a rotary torque from said driven member into said shaft until rotary movement of said nut is restrained, said rotary torque thereafter rotating said driven member to reduce the force of the axially resilient member and allow the drive member to rotate independent of said driven member.

4,442,929

HYDRAULIC CLUTCH

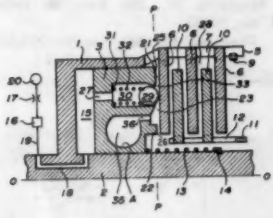
Shinobu Uchida, Hirakata, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Apr. 26, 1982, Ser. No. 372,007

Claims priority, application Japan, Apr. 30, 1981, 56-63975[U]

Int. Cl.³ F16D *25/06*

U.S. Cl. 192—52 **3 Claims**



1. A hydraulic clutch comprising friction plates; a hydraulic piston for pressing the friction plates; a pair of annular protrusion respectively formed at radially outer and relatively inner portions of the piston with an annular space therebetween, said protrusions being designed to press the adjacent friction plate; an oil passage formed in the piston through which the annular space is connected to a pressure chamber at the back of the piston; a check valve arranged in the oil passage, said check valve including a ball forced to close toward the friction plates and partially projecting beyond the protrusions toward the friction plates and an accumulation chamber formed in the piston and connected to the annular space.

4,442,930

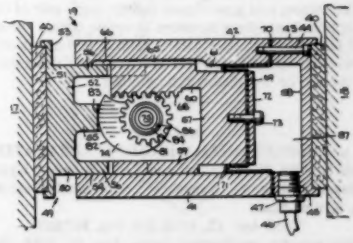
AIR ACTUATED FORCE INTENSIFYING PISTON AND CYLINDER ASSEMBLY FOR BRAKES AND CLUTCHES

Edwin J. Montalvo, Sr., 200 Riverside Industrial Pkwy., Portland, Me. 04103

Filed Jun. 15, 1981, Ser. No. 273,760

Int. Cl.³ F16D *25/04*

U.S. Cl. 192—85 AB **13 Claims**



1. A mechanism for selectively frictionally coupling two relatively rotatable bodies of the type comprising two parallel friction plates connected to a first one of said bodies transverse to the axis of rotation of said first body, the second of said bodies carrying an expandible fluid actuated piston and cylinder means mounted between said friction plates for engagement of friction members carried by said piston and cylinder means with said friction plates upon expansion of said piston and cylinder means, said piston and cylinder means being mounted to float in a cylinder carrying member on said second body for applying equal force against both said friction plates upon expansion of said piston and cylinder means, wherein the improvement comprises said piston and cylinder means having

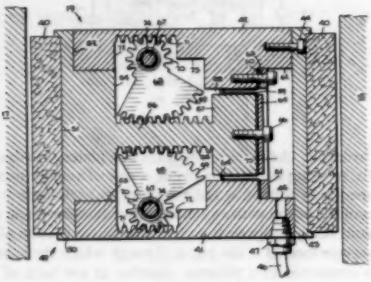
cam means therein for mechanically intensifying said force against said friction plates upon expansion of said piston and cylinder means, said cam means comprising a cam having an arcuate surface of gradually increasing radius mounted on a pin within said cylinder.

4,442,931

AIR ACTUATED FORCE INTENSIFYING PISTON AND CYLINDER ASSEMBLY FOR BRAKES AND CLUTCHES

Edwin J. Montalvo, Sr., 200 Riverside Industrial Pkwy., Portland, Me. 04103

Filed Jun. 15, 1981, Ser. No. 273,908
Int. Cl.³ F16D *25/063*
U.S. Cl. 192—85 AB **6 Claims**



1. A mechanism for selectively frictionally coupling two relatively rotatable bodies of the type comprising two parallel friction plates connected to a first one of said bodies transverse to the axis of rotation of said first body, the second of said bodies carrying an expandible fluid actuated piston and cylinder means mounted between said friction plates for engagement of friction members carried by said piston and cylinder means with said friction plates upon expansion of said piston and cylinder means, said piston and cylinder means being mounted to float in a cylinder carrying member on said second body for applying equal force against both said friction plates upon expansion of said piston and cylinder means, wherein the improvement comprises said piston and cylinder means having gear means therein for mechanically intensifying said force against said friction plates upon expansion of said piston and cylinder means, said gear means comprising a pair of diametrically opposed members mounted to rotate within the cylinder of said piston and cylinder means, each of said members having gear teeth at opposite ends of the member for meshing with teeth formed on the piston and cylinder.

4,442,932

COMBINATORIAL WEIGHING APPARATUS

Takashi Sashiki, Nagaokakyo, and Keiko Sakaeda, Kyoto, both of Japan, assignors to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

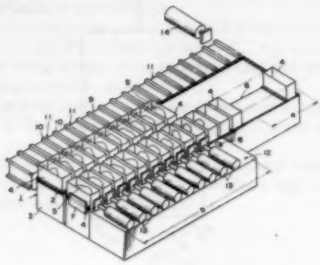
Filed Apr. 12, 1982, Ser. No. 367,667
Claims priority, application Japan, Apr. 10, 1981, 56-54830; Sep. 4, 1981, 56-139983
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—366 **9 Claims**

1. A combinatorial weighing apparatus, having a plurality of juxtaposed weighing machines each of which is provided with a scale, for weighing articles supplied to the weighing machines, selecting the combination of articles that gives a total weight equal or closest to a preset target weight, and discharging the articles so selected, which apparatus comprises:

a carry-in conveyor disposed alongside said juxtaposed weighing machines for continuously delivering vessels, filled with a suitable quantity of articles, from a filling station to a selective transfer station;

transfer means for selectively transferring the filled vessels on said carry-in conveyor from said conveyor to the scales of individual ones of the weighing machines;

a discharge conveyor for retaining and conveying filled vessels received selectively from the scales of said weighing machines and for discharging the articles from said vessels; and



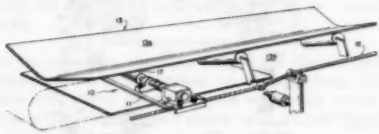
means for pushing the emptied vessels on said discharge conveyor from said discharge conveyor onto the filling station of said carry-in conveyor.

4,442,933

CENTRIFUGAL SWITCH FOR CONTROLLING BELT HAULING SYSTEMS

George E. Conn, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, and George Spector, 3615 Woodworth Bldg., 233 Broadway, both of N.Y. 10007

Filed Jan. 17, 1978, Ser. No. 870,220
Int. Cl.³ B65G *43/00*; H01H *35/02*
U.S. Cl. 198—502 **2 Claims**



1. A centrifugal switch assembly controlling a coal belt hauling system, comprising in combination an endless belt, and an assembly including a conventional centrifugal control switch positioned underneath and in operative engagement with the top run of said belt wherein said switch is enclosed in a housing, including means for adjusting the vertical position of the assembly relative to said belt, wherein said assembly additionally comprises a frame having said centrifugal switch mounted upon one end thereof including a roller at the center of said frame which bears against an underside of said belt top run, said roller being secured on a shaft supported rotatably free in bearings of pillows mounted on said frame, one end of said shaft being connected by means of a coupling to a switch shaft and said frame being supported at its opposite ends upon a pair of wire cables positioned parallel to and along each opposite edge of said belt, said cables extending through parallel inverted channels forming opposite ends of said frame, and being secured to said channels by rope locks mounted on said channels, including a cover, removably snap fitted over said centrifugal switch protectively enclosing the same, wherein said cover includes a sleeve intergal therewith extending over said coupling.

4,442,934

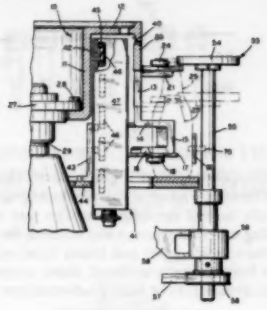
GLASS CONTAINER INSPECTION HANDLING SYSTEM

Arthur L. Dorf; Sam Lovalenti; John J. Pezzin, all of Toledo, Ohio, and Darius O. Riggs, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 203,024, Nov. 3, 1980, Pat. No. 4,378,493. This application Nov. 24, 1982, Ser. No. 444,278

Int. Cl.³ B65G 29/00

U.S. Cl. 198—344 9 Claims



1. Apparatus for handling glass containers in spaced apart series into an inspection position in front of an illuminating means with an uninterrupted view of the container from the side thereof opposite the illuminating means and with means to rotate the container while the container is so positioned comprising:

a generally cylindrical hub, said hub having a horizontally extending periphery which is at a height greater than the height of a container to be inspected;

means connected to said hub for indexing the hub about its vertical axis;

a plurality of spaced-apart, downwardly extending arms connected to the periphery of said hub, said arms being of a length sufficient to extend below the center of gravity of a container positioned adjacent thereto;

container-engaging rollers mounted on said arms at, at least two vertically spaced points, the uppermost rollers located at the finish of the container and said lowermost rollers located below the center of gravity of the container with each arm supporting rollers that are in engagement with the two adjacent containers;

a peripherally spaced guide rail system extending around said hub adapted to engage containers and maintain them in contact with the rollers;

means connected to said hub for indexing said hub; and

means at one of the inspection stations for engaging the finish of the container at said station for rotating the container positioned thereat about its central vertical axis.

4,442,935

PALLET MAGAZINE

Hans Gregg, Woerthsee, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

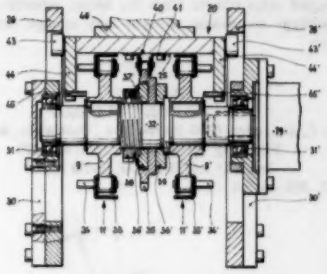
Filed Jul. 8, 1981, Ser. No. 281,525

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033373

Int. Cl.³ B65G 35/08

U.S. Cl. 198—648 7 Claims

1. In a pallet magazine for transporting workpieces from a loading station to a working station and to an unloading station, said pallet magazine having a frame and two endless rotating chains arranged parallel to one another and which undergo a 180° turn at said loading station and at said unloading station by being guided around sprocket wheels having horizontal axles supported on said frame, a sprocket wheel located at one of said loading station and said unloading station being driven for rotation by a motor, said pallet magazine further including plural pallets, which carry said workpieces thereon, having first means at least partially gripping around said two chains, the improvement comprising wherein said first means is spaced freely below an upper conveyor reach of said chains and hanging freely on a lower conveyor reach of said chains so that a frictional force alone effects a carrying of



said pallet with said upper and lower conveyor reaches, and wherein at each 180° turn of said chains, there is arranged a gear oriented coaxially with said sprocket wheels, between said sprocket wheels and rotated at the same speed as said sprocket wheels, which gear engages second means arranged on the underside of each said pallet to effect a controlled driving movement of said pallet from a location on said upper conveyor reach to a location on said lower conveyor reach and vice versa.

4,442,936

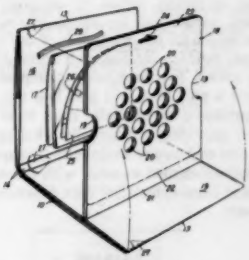
ENGINE OIL DRAINING ASSEMBLY

Robert L. Densham, 513 N. Peachtree Rd., Dunwoody, Ga. 30338

Filed Nov. 13, 1978, Ser. No. 959,886

Int. Cl.³ B65D 69/00

U.S. Cl. 200—223 2 Claims



1. An engine oil change kit comprising a receptacle body formed of sheet material and being erectable to produce an open top receptacle and foldable into a collapsed state, a flexible bag liner for the receptacle body and being oil impermeable, a strainer adapted to span the open top of the erected receptacle, integral support elements for the strainer on the erected receptacle, a collapsible and erectable funnel for use in delivering fresh oil to an engine, and an outer package for said receptacle body and said funnel in the collapsed state, for said liner in a folded state and said strainer, whereby said kit is essentially flat and compact when packaged, said receptacle body having an intermediate book-like form including hinged sides, said folded liner, said strainer and said funnel in the collapsed state being insertable between said hinged sides with

said sides folded toward each other in substantial parallelism for placement as a unit in said outer package, said outer package being formed from a snug fitting flexible wrapper fully enclosing and confining said kit, said strainer comprising a flat plate-like element including a detachable strip along one edge thereof, the far edge portion of the strainer having a support aperture, said strip adapted to bottom against the hinge of the collapsed receptacle body in said intermediate form with said far edge portion and aperture extending beyond the ends of said hinged sides remote from the hinge, whereby a display rack package suspension element may engage through said aperture.

4,442,937

COVER FOR GOLF BAG

Roscoe E. Delauder, 8300 Harris Ave., Baltimore, Md. 21234

Filed Sep. 29, 1982, Ser. No. 428,137
Int. Cl.³ A63D *55/00*; B65D *85/00*
U.S. Cl. 206—315.4 **3 Claims**

1. In a system providing a pivotal cover for the top of an elongate golf bag having a rim that is substantially rigid and defines: a top opening area for golf club access and front and a back and sides, and being of the type which may have a strap, means for extending a back portion of a said golf bag and top opening area adjacent thereto in an upward direction, said pivotal cover including: means for covering said upwardly extended back portion and top opening area, and means for pivoting said means for covering clear of said top opening area to a fully open position for golf club access the improvement comprising: means for detachably clamping the extending means around a part of a said golf bag rim, said extending means comprising a substantially rigid hemi-cylindrical upright member providing substantially a half-circle arc of golf club access, and said means for covering comprising a substantially rigid helmet-shaped member with dome and brim, cutaway sides and hemi-cylindrical skirt depending downwardly from the dome.

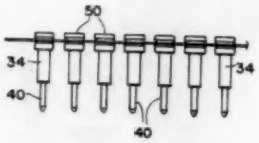
4,442,938

SOCKET TERMINAL POSITIONING METHOD AND CONSTRUCTION

James V. Murphy, Warwick, R.I., assignor to Advanced Interconnections, Warwick, R.I.

Filed Mar. 22, 1983, Ser. No. 477,622
Int. Cl.³ B65D *73/02, 85/24*
U.S. Cl. 206—329 **14 Claims**

1. A construction for temporarily positioning a plurality of socket terminals on an electrical circuit board in a predetermined configuration prior to solder connection thereto, comprising a sheet of relatively thin, flexible, electrically insulative, resinous plastic material having a plurality of holes extending therethrough, said holes arranged in a planar configuration about said sheet to correspond with said predetermined positioning of said socket terminals in said circuit board, a plurality of socket terminals each having a pin adapted for insertion into an opening in said board at their lower end and an enlarged generally cylindrical head at their upper end, said enlarged head having upper and lower sections defined by an inwardly extending perimetal groove intermediate the height thereof and of a lateral extent less said upper and lower sections, said holes of a perimetal extent less than said head sections but



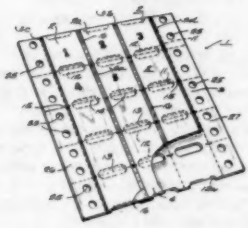
generally corresponding to or slightly greater than that of said groove, said terminals adapted for positioning upon said sheet with the heads thereof extending through said holes and the sheet extending into said grooves and wherein the leading edge of at least one of said upper and lower head sections is provided with a longitudinally oriented, sheet contacting surface to enable said terminals to be push positioned into said grooves.

4,442,939

LONGITUDINALLY-SEAMED ASSEMBLY OF SLEEVE MARKERS

Gerald T. Downing, Port Washington, Wis., assignor to W. H. Brady Co., Milwaukee, Wis.

Filed Jun. 7, 1982, Ser. No. 385,426
Int. Cl.³ B65D *85/20, 63/00*
U.S. Cl. 206—345 **6 Claims**



1. In an assembly of sleeve markers comprising webs of flexible sheet material and means defining individual tubular sleeve markers that are manually detachable from the assembly,

the improvement wherein:

(1) the assembly is made with two webs arranged in face-to-face relationship and having longitudinal axes disposed parallel to one another;

(2) the means defining individual sleeve markers consist of longitudinal seams joining the two webs together and transverse severance lines extending across the webs,

(a) there being a plurality of spaced longitudinal seams in the assembly, and

(b) there being a plurality of spaced transverse severance lines, with each transverse severance line extending at least between the outermost longitudinal seams in the assembly,

(3) spaced rows of transverse apertures defined in at least one of the webs and extending transversely across the assembly, there being at least one transverse aperture for each individual sleeve marker, with each row of transverse apertures being positioned to be intersected by a transverse severance line; and

(4) a longitudinal separation line extending along each longitudinal seam;

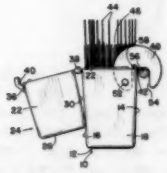
an individual sleeve marker being manually detachable from the assembly along the transverse severance lines and longitudinal separation lines, each individual sleeve marker having opposed closed edge portions defined by parts of an adjacent pair of longitudinal seams and opposed open end portions defined by parts of an adjacent pair of transverse severance lines and having a portion of a transverse aperture along at least one of its open ends.

4,442,940

CONTAINER FOR USE IN STORING COUPONS

Burt H. McIntosh, 320 S. Boston #911, Tulsa, Okla. 74103

Filed Sep. 30, 1982, Ser. No. 430,938
Int. Cl.³ B65D *85/00*
U.S. Cl. 206—425 **2 Claims**



1. A container for use in storing coupons, notes, and the like between index cards and providing means for supporting the container on the edge of a shopping cart or the like, comprising:

a container lower portion having a closed bottom, front and rearward sidewalls, end walls and an open top,

a container upper portion having a closed top, front and rearward sidewalls, end walls and an open bottom;

the container upper portion rearward sidewall, being hinged to the lower container portion rearward sidewall whereby the upper portion can be pivoted to a closed position on the lower portion or pivoted to an open position in which the open tops of the upper and lower portions are exposed;

the lower and upper container portions being dimensioned to receive index cards therein, the upper portion of the cards extending into the container upper portion when the upper portion is in the closed position and the upper portion being dimensioned to receive coupons, notes and the like in a vertical manner when in an opened position;

a first support tab secured to one end wall of said container lower portion; and

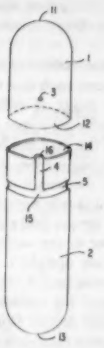
a second support tab secured to the other end wall of said container lower portion, the support tabs being of relatively thin planar configuration and pivotal in planes parallel said end walls, said tabs being pivotal forwardly of said container lower portion forward wall, and each support tab having means forming a hook to receive a support edge, such as the upper edge of a shopping cart, whereby the container may be supported with said bottom portion held uprightly and with said top portion hinged to the open position, the contents of the container lower portion, such as index cards, coupons, etc. being readily available for examination and retrieval and storable in the container opened top portion, said tabs being pivotal rearwardly to extend within said container lower and upper portions when said container upper portion is closed, the interior of said container lower portion being unencumbered to receive contents therein.

4,442,941

ANTI-SPILLING DRUG CAPSULE

Alec D. Keith, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Filed Jan. 11, 1982, Ser. No. 338,257
Int. Cl.³ B65D *85/56, 6/02*
U.S. Cl. 206—540 **4 Claims**



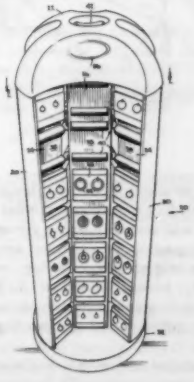
3. A capsule suitable for housing a plurality of pellets having a first member and a second member, said first member having a raised portion and said second member having a connecting communication with said annular groove, each of said connecting groove and said annular groove having a depth at least as great as the height of said raised portion and said annular groove having a width approximately the same as the width of said raised portion, said connecting groove touching the open end of said second member to permit the mating of said raised portion with said connecting groove, said first member being locked into said second member by positioning said raised portion in said annular groove at a position remote from said connecting groove.

4,442,942

CARDED MERCHANDISE DISPLAY

Raymond J. Cuminale, New York, N.Y.; Stanley W. Otto, Platte City; Jerry L. Knipp, Grand View; Bernard P. Seibolt, Kansas City, all of Mo., and Fred E. Yarkoni, Paramus, N.J., assignors to Hallmark Cards, Inc., Kansas City, Mo.

Filed Mar. 15, 1982, Ser. No. 358,101
Int. Cl.³ A47F *7/02*
U.S. Cl. 211—163 **10 Claims**



1. Apparatus for displaying merchandise mounted on display

cards generally "C"-shaped in cross-section having an upper channel and a bottom channel, one channel being wider than the other channel, said apparatus comprising:

(a) a vertical central upright having at least two faces, each face having at least one pair of upper and lower rungs of different widths that can mesh, respectively, with the upper and lower channels of a display card so that the card can be removed easily from the rungs only by sliding it from the rungs in a direction essentially parallel to the length of the rungs;

(b) a plurality of vertical rotatably mounted side uprights having at least two faces, each face having at least one pair of upper and lower rungs of different widths that can mesh, respectively, with the upper and lower channels of a display card so that the card can be removed easily from the rungs only by sliding it from the rungs in a direction essentially parallel to the length of the rungs; and

(c) means for rotating each side upright from a first position to a second position, the vertical sides of the side uprights being sufficiently close to the vertical sides of the central upright when each side upright is in its first position so that display cards cannot be slid free from the rungs of any face of any upright and the vertical sides of the side uprights being sufficiently distant from the vertical sides of the central upright when each side upright is in its second position so that display cards can be slid free from the rungs of any face of any upright.

4,442,943

FLOATING CRANE STABILIZER

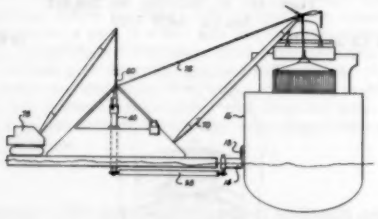
James T. Triplett, P.O. Box 4, Chester, S.C. 29706

Filed Nov. 19, 1981, Ser. No. 322,954

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ B66L *23/52*

U.S. Cl. 212—192 **5 Claims**



1. A device for attaching a floating crane to a structure, said floating crane including a generally annular float assembly, a boom carried on said assembly, and a power-operated means for rotating said crane about a vertical axis when moving a load supported on said boom said device comprising:

a spacing member having one end attached to said structure;

a vertically extending spud extending between said floating crane and the other end of said spacing member on said vertical axis.

means for connecting said spud to said spacing member and said floating crane so that said floating crane can be rotated relative to said structure on said vertical axis.

4,442,944

SATURATED POLYESTER RESIN BOTTLE AND STAND

Yataro Yoshino, Tokyo; Takami Tsukada, Chiba; Tadao Saito, and Takamitsu Nozawa, both of Tokyo, all of Japan, assignors to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Division of Ser. No. 251,530, Mar. 3, 1980, Pat. No. 4,367,820. This application Sep. 23, 1982, Ser. No. 422,061

Int. Cl.³ B65D *23/00, 8/12*

U.S. Cl. 215—1 C **5 Claims**

1. In combination: a bottle and a stand, said bottle comprising a body portion and a bottom, said body portion including at its top an opening and connecting at its lower most end to said bottom, said bottom being hemispherical in shape and of smaller diameter than said body portion whereby a step is defined where said bottom meets said body portion; said stand comprising an inside surface and an outside surface, said inside surface receiving said bottom, said outside surface having an upper circumference at least equal to said body portion and a narrower lower circumference said inside surface having an upper circumference at least equal to said bottom portion and a narrower lower circumference and defining between said inside upper circumference and said inside lower circumference more than two right-angled stepped shoulders such that said bottle rests in point line contact only with the corners of at least two of said stepped shoulders.

4,442,945

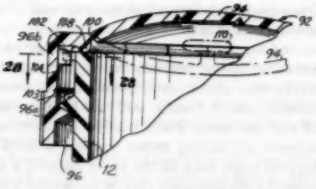
UNITARY SCREW-TYPE SAFETY CLOSURE AND CLOSURE-CONTAINER COMBINATION

Jeffrey Sandhaus, Rte. 9W, Snedens Landing, N.Y. 10956

Continuation-in-part of Ser. No. 335,216, Dec. 28, 1981, Pat. No. 4,413,742. This application Jul. 19, 1982, Ser. No. 399,237

Int. Cl.³ B65D *55/02*

U.S. Cl. 215—218 **36 Claims**



1. A safety closure having a unitary or one-piece construction comprising:

a closed top having a peripheral edge region;

an interiorly threaded skirt integral with and depending from the peripheral edge region of said top;

locking means formed integrally with said closure and movable under the action of actuating means from a locking position to a non-locking position; and

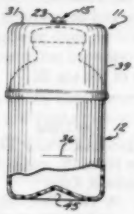
actuating means for moving said locking means from the locking position to the non-locking position, said actuating means being constituted by said top of said closure which has a substantially dish-shaped locking configuration such that the application of a pressure on said top in excess of a certain minimum required pressure will deform said top into a non-locking configuration and result in movement of said locking means from the locking to the non-locking position.

4,442,946

TAMPER RESISTANT CLOSURE APPARATUS

Christopher MacDonald, 2300 Fairview Ave., Apt. D-203, Costa Mesa, Calif. 92626, and Vesta J. Crow, 21138 Adriatic Ave., Long Beach, Calif. 90810

Filed Dec. 17, 1982, Ser. No. 433,388
Int. Cl.³ B65D *41/48*
U.S. Cl. 215—230 **10 Claims**



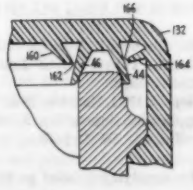
1. Tamper resistant closure apparatus comprising:
a container formed with a body having an opening;
a cap removably secured to said opening;
a fastener stem on said cap;
a cup shaped shroud for covering said cap and including a top wall spaced from and overlying the top of said cap and being formed centrally with an aperture receiving said stem, said shroud further including a peripheral skirt spaced from and projecting in covering relationship over the periphery of said cap to block access to said cap and;
a fastener head integral with said stem and operable to non-releasably lock said shroud over said cap to block access thereto whereby removal of said cap necessitates permanent physical alteration of said stem, head or shroud thus leaving perceivable evidence that said cap has been removed.

4,442,947

PLASTIC CLOSURE WITH SEALING FLAPS

John N. Banich, Sr., Chicago, Ill., assignor to Continental White Cap, Inc., Northbrook, Ill.

Filed Jan. 18, 1983, Ser. No. 459,064
Int. Cl.³ B65D *53/00*
U.S. Cl. 215—344 **10 Claims**



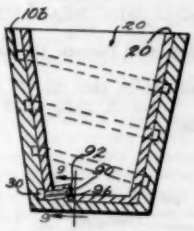
1. A closure for a container, said closure comprising a cap-like member having an end panel and a depending skirt, said skirt carrying retaining means for locking engagement with a container and said end panel carrying sealing means for sealing engagement with a container, said sealing means including a frustoconical sealing flap depending from said end panel and having radially inner and outer surfaces, one of said surfaces being adapted to engage a container neck finish in sealing engagement, a protruding abutment having a primary flap engaging face facing the other of said surfaces and spaced from said other surface at only generally mid-length of said flap for restricting deflection of said flap when engaged with a container, said other surface being joined to said end panel in an area axially beyond and radially spaced from an area in which said one surface is joined to said end panel whereby said flap will automatically wrap around a container neck finish.

4,442,948

DRINKING VESSEL

Richard C. Levy, 6737 Newbold Dr., Bethesda, Md. 20817, and Bryan McCoy, 3139-9 University Blvd., Kensington, Md. 20795

Filed Sep. 16, 1982, Ser. No. 418,653
Int. Cl.³ A47G *19/22*; G09F *3/00*
U.S. Cl. 220—90.2 **18 Claims**



1. A drinking vessel comprising:
an inner shell and an outer shell, said outer shell being adapted to removably receive said inner shell in the interior thereof; and
means for forming at least one fluid flow path of predetermined non-linear configuration between said inner and outer shells, the interior of said fluid flow path being substantially exposed to facilitate cleaning when said inner shell is removed from said outer shell;
said outer shell including a transparent portion disposed to display fluid flow through at least a portion of said non-linear fluid flow path;
said inner shell including at least one aperture disposed to communicate between the interior of said inner shell and said fluid flow path when said inner shell is received by said outer shell;
said fluid flow path including an access to a user when said inner shell is received by said outer shell, whereby said user can draw fluid from the interior of said inner shell through said aperture into said fluid path and through said fluid path access.

4,442,949

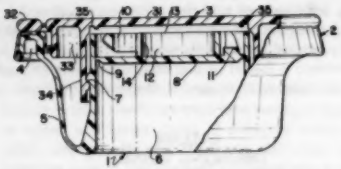
TEAR OPEN CLOSURE ASSEMBLY

Davis B. Dwinell, Warren, and Jeremiah J. Laurizio, New Providence, both of N.J., assignors to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Mar. 21, 1983, Ser. No. 476,999
Int. Cl.³ B65D *49/12*
U.S. Cl. 220—257 **10 Claims**

10. In container closure construction, a molded plastic closure having circumferentially disposed container wall engaging means, a central fluid passage closed off by a recessed integrally molded sealing diaphragm, a weakened tearing zone of reduced cross sectional thickness surrounding said diaphragm, a pull member integrally connected to said diaphragm

adjacent said tearing zone and substantially overlying said diaphragm, a closure cap forming part of said closure construction and overlying said fluid passage in spaced relation to said diaphragm so as to create a cylindrical void within which said



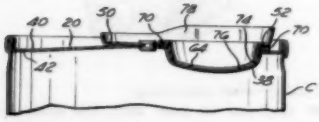
pull member is housed and axially extending support means within said void adapted to restrain said diaphragm against excessive deflection in response to instantaneous pressure surge.

4,442,950

OPENING AND CLOSING MEANS FOR A CONTAINER TOP

Thomas P. Wilson, 4063 Deervale Dr., Sherman Oaks, Calif. 91403

Filed Jan. 24, 1983, Ser. No. 460,394
Int. Cl.³ B65D *41/32*
U.S. Cl. 220—269 **12 Claims**



1. A top for initially closing and sealing a container, adapted to enable selective opening, reclosing, and reopening of the container, as desired by the user, comprising:

(a) a body member, adapted to be mounted on the container, and to initially close and seal the conainer, including means for enabling an opening to be formed therein;

(b) a tab, adapted to be mounted on the body member, including means for enabling the tab to be selectively operable for engaging or disengaging the body member, means for selectively engaging the opening-forming means in the body member so as to enable the opening to be formed, for selectively opening the container, and means for selectively engaging or disengaging the opening formed in the body member, for selectively reclosing or reopening the container; and

(c) means for mounting the tab on the body member, to enable selective operation of the tab relative to the body member.

4,442,951

HERMETICALLY SEALED CONTAINER

Hiroshi Nakazawa, Funabashi, and Makoto Kuji, Saitama, both of Japan, assignors to Toho Sheet Frame Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1983, Ser. No. 457,571
Claims priority, application Japan, Aug. 18, 1982, 57-124012[U]
Int. Cl.³ B65D *45/32*
U.S. Cl. 220—319 **20 Claims**

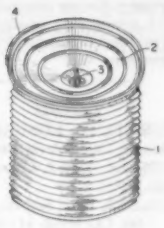
1. A hermetically sealed container with an openable top lid, comprising:

a container body (1);

a top lid (2);

a binding member (4) for mutually binding said container body and said top lid;

packings (5)(6) for sealing respectively mounted on said container body and said top lid;



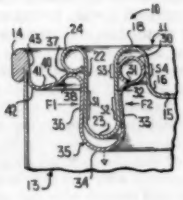
wherein said top lid (2) is recessed toward the center thereof and is provided at said center with a valve for pressure releasing, filling and pressure measuring, the upper end of said valve being positioned not exceeding a plane containing the upper rim of the top lid.

4,442,952

QUAD-SEAL SNAP LOCK

Leon M. Patarini, Palos Hills, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Filed Dec. 28, 1981, Ser. No. 335,305
Int. Cl.³ B65D *43/06*
U.S. Cl. 220—354 **21 Claims**



1. A two-piece closure for use with a container comprising a ring and a plug, said plug including an annular axially projecting plug portion, said ring including an axially opening annular channel adapted to receive said plug portion, said annular channel being defined by inner and outer channel walls and a bight wall therebetween, and means radially outboard of said outer channel wall responsive to insertion of said plug portion into said annular channel for radially inwardly deflecting said outer channel wall to bring the same into intimate friction engagement with said plug portion.

4,442,953

APPARATUS FOR SUPPLYING FLUID OF PRESET QUANTITY

Yoshikazu Miyamoto, Kokubunji; Tetsuya Kakimoto, Tatomi, and Wasaburo Tanida, Tokyo, all of Japan, assignors to Tokico Ltd., Kawasaki, Japan

Filed Sep. 2, 1981, Ser. No. 298,878
Claims priority, application Japan, Sep. 5, 1980, 55-123350
Int. Cl.³ B67D *5/08*
U.S. Cl. 222—14 **6 Claims**

1. An apparatus for supplying fluid of preset quantity comprising:

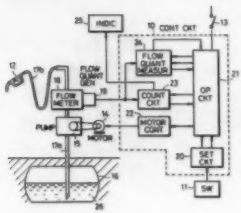
a fluid supplying pump provided in a fluid supplying pipe arrangement;

a motor for driving said fluid supplying pump;

metering means for metering the fluid flowing in said fluid supplying pipe arrangement;

presetting means for presetting a quantity of fluid to be supplied; and

control means coupled to said motor, said metering means, and said presetting means, for detecting that supplied quantity of fluid measured by said metering means has reached a quantity smaller than the preset fluid supplying quantity preset by said presetting means by an estimated oversupply quantity of fluid, and stopping said motor from being driven,



said estimated oversupply quantity of fluid being a quantity equal to a quantity of fluid supplied by said fluid supplying pump after said motor is stopped from being driven and rotates due to inertia,

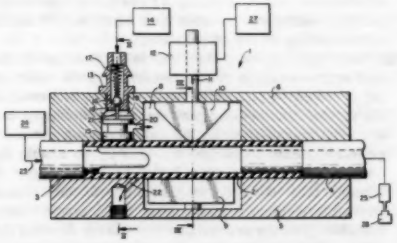
said control means including a first register prestored with a coefficient, and estimating means for estimating said estimated oversupply quantity of fluid from said coefficient stored in said first register.

4,442,954

SELF-PRESSURIZING PINCH VALVE

Wieslaw Bergandy, Arnold, Md., assignor to National Instrument Company, Inc., Baltimore, Md.

Filed Jul. 30, 1982, Ser. No. 403,331
Int. Cl.³ B67D *5/08*; F16L *55/14*
U.S. Cl. 222—55 **9 Claims**



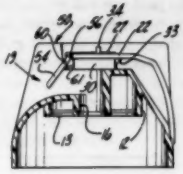
9. In a liquid filling machine for dispensing predetermined quantities of liquid comprising a flow line for conveying liquid under pressure from a supply to nozzle means for dispensing said liquid, the improvement comprising a self-pressurizing pinch valve means provided in said flow line between said nozzle means and said supply for controlling the flow of liquid in said flow line, said pinch valve means including flexible hose means for conveying said liquid, chamber means about at least a portion of said flexible hose means, said flexible hose means being adapted to be pinched in said chamber means for valving the flow of liquid therethrough, and means responsive to movement of said flexible hose means for controlling the pressure in said chamber means so that it substantially balances the internal pressure in said hose means.

4,442,955

CHILD-RESISTANT AND TAMPER INDICATING OVERCAP

Randall G. Bush, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.

Continuation-in-part of Ser. No. 163,939, Jun. 30, 1980, Pat. No. 4,333,589. This application Jun. 7, 1982, Ser. No. 385,829
Int. Cl.³ B65D *83/14*; B67D *5/32*
U.S. Cl. 222—153 **6 Claims**



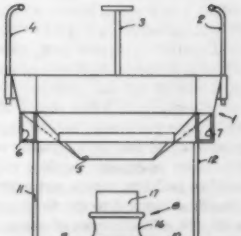
1. A child-resistant and tamper indicating overcap for a pressurized container of the type having an axially movable dispensing valve at the center top of the container, said overcap comprising: a generally cup-shaped body having a depending skirt with an annular lip adapted to be fastened to a container, a valve receiving cavity formed in said body, a finger depression extending diametrically across the top of said body and intersecting said valve receiving cavity, a valve guard unitary with said body and slidably mounted in said finger depression for movement radially of said valve receiving cavity between a valve-guarding position and a valve-actuating position, an indicator tab, hinge means connecting said indicator tab to said valve guard for relative hinging movement, lock means on said tab engageable with said body to prevent radial movement of said valve guard to said valve actuating position, said hinge means connecting said tab to said guard being frangible to permit detachment of said tab from said guard to permit movement of said guard to said valve-actuating position and give visible evidence of tampering.

4,442,956

APPARATUS FOR EMPTYING SINGLE OR MULTI-WALLED PACKAGES

Sune J. R. Carlsson, Tallåsvägen 8, Falkenberg, Sweden

PCT No. PCT/SE80/00275, 371 Date Jul. 6, 1981, 102(e) Date Jul. 6, 1981, PCT Pub. No. WO81/01278, PCT Pub. Date May 14, 1981
PCT Filed Nov. 5, 1980, Ser. No. 285,188
Claims priority, application Sweden, Nov. 5, 1979, 7909146
Int. Cl.³ B65D *33/36*; B65B *69/00*
U.S. Cl. 222—185 **5 Claims**



1. An apparatus for emptying packages which have discharge mouth portions, comprising support means for support-

ing the package which is to be emptied, said support means having an opening which permits the discharge mouth portion of the package to extend downwardly below the support means, an outlet member located below the support means and having a ring for engaging the discharge mouth portion of the package, said ring being shiftable from an upper position to a lower position, said ring when in its upper position being engageable with the discharge mouth position of a package which is supported on the support means, said ring being shiftable downwardly from its upper position to a lower position to stretch the package and avoid the formation of folds which render the emptying operation more difficult, and a frame means located in said ring for entering the discharge mouth portion to prevent the discharge mouth portion from folding inwardly.

4,442,957

FLUID INJECTOR DEVICES

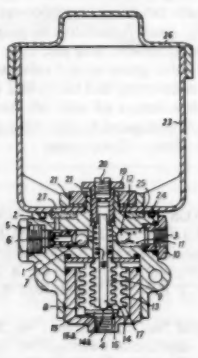
Brian P. Neal, Bristol, and Alan R. Turner, Bath, both of England, assignors to Bendix Westinghouse Limited, Bristol, England

Filed Apr. 15, 1981, Ser. No. 254,370

Claims priority, application United Kingdom, May 3, 1980, 8014911

Int. Cl.³ B65D *37/00*

U.S. Cl. 222—207 **9 Claims**



.9. A fluid injector device having a housing defining a chamber therewithin, said housing having an input port, a one-way output port, and a control signal port communicating with the chamber, said control signal port being connected to a positive source of signal pressure, said positive source of signal pressure being located outside of said housing, dividing wall means dividing said chamber into a first region communicating with the input and output ports and a second region communicating with the control signal port, said dividing wall means having a first fluid pressure responsive surface exposed to the fluid pressure level in said first region and a second fluid pressure responsive surface exposed to the fluid pressure level in said second region, the effective area of said second surface being greater than the effective area of said first surface whereby said dividing wall means responds to the force differential created by said signal pressure to move from a rest position to eject fluid from the first region via the output port, and resilient means yieldably urging said dividing wall means toward said rest position.

4,442,958

CONTAINER FOR DISPENSING A VISCOUS LIQUID MEDIUM

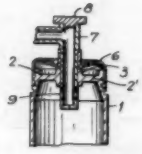
Walter Amos, Wiesbaden, Fed. Rep. of Germany, assignor to Blendax-Werke R. Schneider GmbH & Co., Mainz, Fed. Rep. of Germany

Filed Mar. 9, 1981, Ser. No. 242,072

Claims priority, application Austria, Mar. 10, 1980, 1328/80

Int. Cl.³ B65D *37/00, 5/40*

U.S. Cl. 222—213 **2 Claims**



1. A container from which a viscous liquid contained therein is selectively dispensible, said container comprising:

a tubular body for containing a supply of liquid, said body having a hollow interior open at one end of the body;

a valve body disposed on said container body proximate the open end thereof;

a piston proximate an end of said body opposite its open end and arranged for displacement along said hollow interior toward said open end;

a resiliently deformable container top on said tubular body at said open end and substantially closing the same, said top including an aperture defined therethrough communicating with said hollow interior, said top being selectively deformable from a normal position to a dispensing position substantially in the direction of said hollow interior of the container body and thence resiliently returnable to said normal position; and

an elongated dispensing mouthpiece fixedly secured to said top and extending through said aperture thereof, said mouthpiece including an open mouth disposed exteriorly of said container body and at least a valve opening disposed within the hollow interior of said body, and said mouthpiece further including a passage for liquid communication extending between said open mouth and said valve opening of the mouthpiece;

said valve opening being so defined in the mouthpiece that in said normal position of the container top the valve opening is closed by said valve body whereas deformation of the top to its dispensing position correspondingly carries the mouthpiece to move the valve opening therein to a position remote from said valve body to enable liquid contained in the tubular body to dispensingly flow through said valve opening and out of said container through the open mouth under the increased interior container pressure created by the inwardly directed deformation of said container top from its normal to its dispensing condition;

said tubular body having a substantially continuous sidewall bounding the hollow interior of said body, and said valve body comprising an annular ring supported in radially inwardly spaced relation from said sidewall proximate said container open end and through which said mouthpiece relatively movably extends such that said valve opening of the mouthpiece is disposed within said annular ring in said normal position of the container top to close the valve opening and prevent the flow of liquid contained in the tubular body dispensingly through the mouthpiece, while in said dispensing position of the container top the mouthpiece is relatively moved with respect to said annular ring so that the valve opening is correspondingly carried to a position remote from the annular

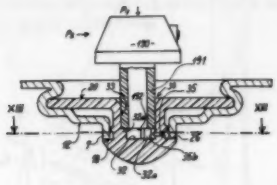
ring to permit the flow of liquid through the opening and out of said container.

4,442,959

SELF-CLOSING VALVE-AND-LID ASSEMBLY

Luigi Del Bon, Feldstrasse 141, and Franco Del Bon, Feldstrasse 139, both of 4663 Aarburg, Switzerland

Filed Apr. 30, 1981, Ser. No. 259,158
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.24 **25 Claims**



1. Self-closing two-piece valve-and-lid assembly adapted for closing the open top end of a container fillable with pressurized product, and having a central assembly axis, comprising

(I) a lid the periphery of which is adapted for being sealingly connected with a top rim of a container sidewall surrounding the said container top opening, and extending generally transverse to said central assembly axis,

(i) said lid having a central dome and a central opening in the middle of said lid dome, and being rigid under conditions of filling product into, and discharging product from said container,

(ii) said lid extending generally in a main lid plane transverse to said central assembly axis,

(iii) said lid dome having a top wall having an outer face and an opposite inner surface facing inward toward the interior of said dome, and a circumferential sidewall which latter extends generally at an angle out of said main lid plane,

(iv) said lid dome comprising a collar portion extending axially relative to said central assembly axis and ending in an annular shoulder means about said central dome opening;

(II) a valve body of elasticaly resilient material, comprising

(a) a valve disc part having an outer face adapted for facing away from a container and an opposite underside face resting, in a peripheral disc zone, on an annular zone of said inner surface of said dome top wall,

(b) a reduced radial diameter valve stem depending from said underside face of said valve disc part and extending axially relative to said central assembly axis, said valve stem having an outer surface;

(c) a valve head at the lower end of, and being of larger radial diameter than, said valve stem, and having an annular face extending in a plane transverse to said central assembly axis, said annular valve head face facing toward said annular shoulder of said collar portion and bearing a first contact zone on said valve head,

(d) a cavity being open in said outer face of said disc part forming a rim therein, and extending from said opening axially downward at least into said valve stem and having a bottom end located near the radial plane in which said first contact zone of said valve head extends,

(e) additional annular sealing means about said valve stem spaced from said valve head and adapted for making sealing contact at all times with said lid dome collar portion in a second contact zone axially spaced from said first contact zone,

(f) duct means in said valve stem, having at least one exit opening for product flow in said cavity and at least one entry opening in a region of the outer surface of said valve stem and head extending from said first to short of said second contact zone thereon,

(g) said valve body having a deformable portion thereof located in a region comprising a part of said valve stem above said duct therein and an annular part of said valve disc vicinal to said valve stem,

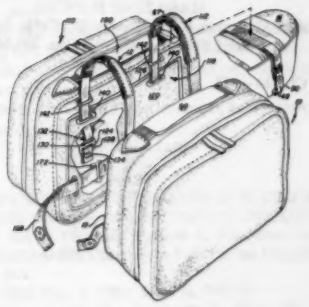
which deformable portion is stretched in axial downward direction toward the interior of a container when said valve-and-lid assembly is opened, '(h) the distance of said annular upward face of said valve head from the underside face of said valve disc part, prior to said valve body being mounted in said lid dome, being shorter than the distance between these same two valve body elements when said valve body is mounted in said lid dome, thereby imparting a bias to said annular upward face of said valve head against said annular shoulder means of said collar portion, thereby biassing said first contact zone of said valve head, when in closed state, into sealing contact with said annular shoulder of said collar portion.

4,442,960

SADDLEBAGS

Bruce W. Vetter, Homer, Ill., assignor to BagMan, Inc., Homer, Ill.

Filed Oct. 22, 1981, Ser. No. 313,637
Int. Cl.³ B62J *9/00*
U.S. Cl. 224—32 A **17 Claims**



1. A pair of saddlebags for a motorcycle or like vehicle comprising:

first and second separable housings;

a flexible strap associated with each of said housings for suspending the housings from the vehicle; and

a first mounting means spanning the width of and being removably secured to a seat on said vehicle for mating with at least one flexible strap extending between said housings for positively locating the housings on the vehicle;

said strap and mounting means having securing means comprising a Velcro type strip on the first mounting means removably engaging with mating means on said strap, said securing means being readily engageable and separable for detachably suspending said housings from said vehicle.

4,442,961

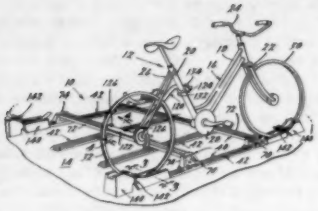
LOAD CARRIER

John A. Bott, 931 Lakeshore Dr., Grosse Pointe, Mich. 48236

Continuation-in-part of Ser. No. 213,675, Dec. 5, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,448
Int. Cl.³ B60P *3/06*
U.S. Cl. 224—42.03 B **50 Claims**

1. A device for supporting and securing a bicycle having a frame and front and rear wheels in an upright position extending longitudinally above a substantially horizontal surface of a vehicle for transport by said vehicle, said device extending

longitudinally in a direction substantially parallel to said bicycle when mounted on said device and extending laterally in a direction substantially perpendicular to said bicycle when mounted on said device and said device comprising a base support secured to said vehicle, first retaining means for engaging said frame to retain said bicycle against lateral movement relative to said vehicle, and second retaining means for engaging said front and rear wheels to retain said bicycle against longitudinal movement relative to said vehicle, said first retaining means being laterally positionable in various operable positions relative to said base support.

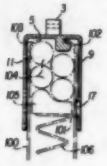


4,442,962

MAGAZINE HANGER

Daniel D. Musgrave, 8201 Caraway St., Cabin John, Md. 20818

Filed Feb. 18, 1981, Ser. No. 235,545
Int. Cl.³ F41C *27/00*
U.S. Cl. 224—255 **7 Claims**



1. A cartridge magazine hanger comprising a casing to fit over the feed end of the magazine, said casing having a top wall and at least two sidewalls, said top wall having releasable means located on the inner surface thereof to engage at least one lip of the magazine.

4,442,963

TAPE ADVANCING METHOD AND APPARATUS WITH FAST TAPE ADVANCE MODE

Frederic F. Grant, Bellflower, Calif., assignor to Datatape Incorporated, Pasadena, Calif.

Continuation-in-part of Ser. No. 171,851, Jul. 24, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,853
Int. Cl.³ B65H *17/32*
U.S. Cl. 226—97 **38 Claims**

24. In apparatus for advancing tape having an information recording surface in engagement with an information transducing head in an information transducing mode, and for advancing tape past said head out of engagement with said head in a fast tape advance mode, the improvement comprising in combination:

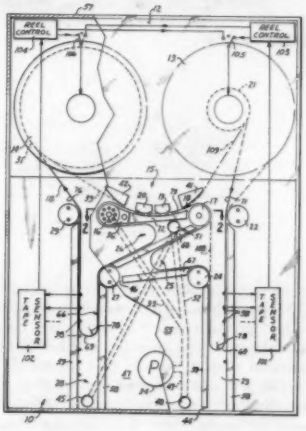
a tape drive capstan;

means for applying said tape to said capstan and for advancing with said capstan said information recording surface of said applied tape in engagement with said information transducing head in said information transducing mode;

means for generating a pressure gradient on a surface of said tape opposite said recording surface in a direction away from said head;

means for disengaging said tape from said capstan for said fast tape advance mode;

means connected to said generating means for maintaining with said pressure gradient said tape out of engagement with said head while said tape is advanced in said fast tape advance mode;



means connected to said tape for advancing said tape past said head in said fast tape advance mode while said pressure gradient maintains said tape out of engagement with said head; and

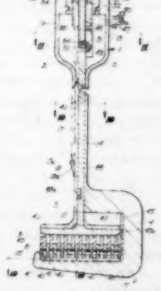
means for terminating generation of said pressure gradient and for reapplying said tape to said head and to said capstan, including means for moving said tape through a distance to said head.

4,442,964

PRESSURE SENSITIVE AND WORKING-GAP CONTROLLED SURGICAL STAPLING INSTRUMENT

Carl T. Becht, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Dec. 7, 1981, Ser. No. 327,932
Int. Cl.³ A61B *17/04*
U.S. Cl. 227—8 **25 Claims**



1. In a surgical stapling instrument of the type having a fixed jaw with an anvil surface thereon with staple clinching

grooves therein, a movable jaw shiftable toward and away from said fixed jaw and carrying a plurality of staples and a driver therefor, means to shift said movable jaw, a staple driver actuator shiftable between a retracted position and an advanced position wherein it actuates said staple driver to cause said staples to pass through tissue located between said fixed jaw and said movable jaw and to be clinched by said anvil surface, and means to shift said staple driver actuator, said surgical stapling instrument having a working gap comprising a range of distances between said fixed jaw and said movable jaw throughout which said staples can be properly implanted and clinched, the improvement comprising latch means permitting shifting of said staple driver

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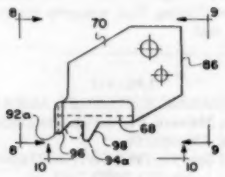
4,442,965

NAIL FEED MECHANISM

Herbert E. Leistner, 167 Sweeney Dr., Toronto, Ontario, Canada

Filed Apr. 20, 1981, Ser. No. 255,837
Int. Cl.³ B25C *1/04*
U.S. Cl. 227—136 **9 Claims**



1. A nail feed mechanism for use in power operated nailing guns of the type having a nail guiding barrel, a nail magazine, for carrying a strip of nails, wherein such nails are joined together in such strip by at least two lengths of wire, said nails being fastened to said wires at spaced intervals, said nail feed mechanism being located to one side of said barrel, for feeding said strip of nails from said magazine to said barrel, a driving member reciprocable within said barrel for driving nails, and power operated means for operating such driving member, thereby separating an endmost nail of said strip from said wires and driving same out of said barrel, and comprising;

means defining a nail feed channel for receiving said strip of nails;

nail feed pawl means reciprocable adjacent to such channel relative to such a strip of nails; pairs of forward and rear tooth members on such pawl means, and defining groove means between such pairs for reception of said wires interengageable with nails in such strip, whereby to advance the endmost nail in such strip into said barrel;

power operated means for operating said pawl means in timed relation to the operation of said driving member;

contoured surfaces on two of said forward teeth of said pairs around which said wires are bent over when said endmost nail is driven along said barrel by said driving member, and,

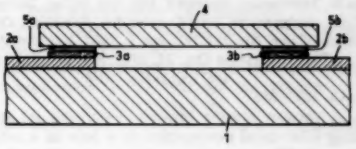
spacer means on some of said forward teeth adjacent to said contoured surfaces, such spacer means maintaining such endmost nail out of contact with such bent over portions of such wires diring driving of such endmost nail.

4,442,966

METHOD OF SIMULTANEOUSLY MANUFACTURING MULTIPLE ELECTRICAL CONNECTIONS BETWEEN TWO ELECTRICAL ELEMENTS

Philippe Jourdain, Evreux, France; Georges E. Florens, deceased, late of Clerrey, France, and Georges A. L. Souquet, representative, Paris, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1981, Ser. No. 311,211
Claims priority, application France, Oct. 15, 1980, 80 22083
Int. Cl.³ B23K *31/00*
U.S. Cl. 228—123 **4 Claims**



1. A method for simultaneously electrically connecting two semiconductor elements each having a plurality of mutually-opposing contact pad metallizations, which comprises:

applying an electrically-conductive paste to each of said contact pad metallizations on at least one of said two elements; then

polymerizing said electrically-conductive paste; then

compressing said polymerized electrically-conductive paste between the mutually-opposing contact pad metallizations of said two elements; and

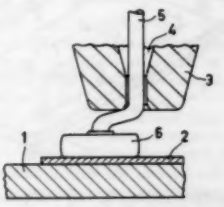
heating at least one of said two elements being connected during compression.

4,442,967

METHOD OF PROVIDING RAISED ELECTRICAL CONTACTS ON ELECTRONIC MICROCIRCUITS

Hermanus A. van de Pas, and Huibert A. Knobbout, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,724
Claims priority, application Netherlands, Mar. 20, 1981, 8101371
Int. Cl.³ H01L *21/441*
U.S. Cl. 228—159 **2 Claims**



1. A method of providing a raised contact portion on a contact area of an electronic microcircuit, which comprises:

passing a metal wire through a capillary wire guide;

forming a ball at one end of said metal wire by heating said wire;

attaching said ball to said contact area by pressing said ball against said contact area with an end of said capillary wire guide;

moving said capillary wire guide upwards and laterally with respect to said contact area;

lowering said capillary wire guide to form a notch in said

metal wire adjacent said ball with the end of said capillary wire guide; and

severing said metal wire at the area of said notch.

4,442,968

BRAZING FILLER METAL COMPOSITION AND PROCESS

John H. McMurray, Stratford, and Jule Miller, Derby, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Division of Ser. No. 281,793, Jul. 9, 1981, Pat. No. 4,394,347.
This application Oct. 21, 1982, Ser. No. 435,668
Int. Cl.³ B23K *1/04*
U.S. Cl. 228—231 9 Claims

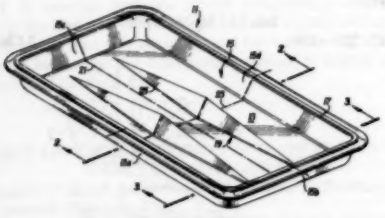
1. A vacuum brazing process comprising (a) applying a brazing filler metal composition to a hole in a subject base metal, said filler metal composition comprising, by weight, from about 8.0% to about 11.0% chromium, from about 2.0% to about 3.0% boron, from about 3.0% to about 4.5% silicon, from about 2.5% to about 4.0% iron, from about 7.0% to about 9.0% tungsten, a maximum of about 0.06% carbon, and the remainder nickel, and said subject base metal having a higher melting point than said filler metal composition; (b) heating to the brazing temperature of the filler metal composition; and (c) cooling.

4,442,969

REINFORCED PACKAGING TRAY

M. James Holden, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 28, 1983, Ser. No. 489,636
Int. Cl.³ B65D *1/34, 1/44*
U.S. Cl. 229—2.5 R 20 Claims



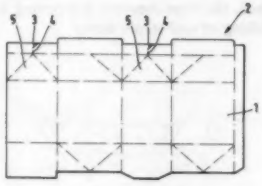
1. An integral packaging tray comprising a generally rectangular bottom and sidewalls extending upwardly from edges of said bottom, said sidewalls being of substantially the same height and being integrally connected around the periphery of said bottom, said bottom containing at least one integrally formed reinforcing rib projecting upwardly therefrom and extending along said bottom from a substantially centerline portion of said bottom defined between two opposing sidewalls toward said two opposing sidewalls, said rib having a maximum cross-sectional dimension at said substantially centerline portion and tapering to a minimum cross-sectional dimension at its termination with a uniformly reducing cross-sectional dimension as it approaches said two opposing sidewalls.

4,442,970

PACKAGE FOR LIQUIDS

Jürgen Färber, Kaarst, Fed. Rep. of Germany, assignor to PKL Papier-und Kunstoff Werke Linnich GmbH, Dusseldorf, Fed. Rep. of Germany

Filed May 6, 1982, Ser. No. 375,776
Claims priority, application Fed. Rep. of Germany, May 29, 1981, 312141
Int. Cl.³ B65D *5/74*
U.S. Cl. 229—17 G 4 Claims



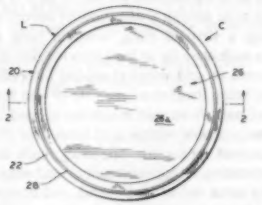
1. In a plastic-coated cardboard blank for folding into a parallelepipedal package that is intended for liquids, the blank having opposite triangular areas that are to be folded inwardly into a double-M closure for a gable-shaped top and such areas each has an upper edge and a middle fold line extending to the apex of said triangular area, the improvement which comprises providing each of said opposite triangular areas with a slit that slants from the upper edge down to at least to the middle fold line to form a non-folding flap, whereby the folded package has an improved seal.

4,442,971

PEELABLE, SEALABLE CLOSURE ARRANGEMENT

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 13, 1982, Ser. No. 416,949
Int. Cl.³ B65D *5/64*
U.S. Cl. 229—43 5 Claims



1. A peelable, sealable closure arrangement for a container body and lid adapted to insure integrity of seal when internal pressure increases within the container, said arrangement comprising:

(a) a tubular container body, open at the upper end, including:

(i) a body wall;

(ii) a peripheral rim extending radially outward from an upper marginal portion of said body wall;

(b) a lid adapted for interlocking and hermetic sealing engagement with said container body;

(c) said lid including a generally flat central panel having:

(i) a layer of paperboard;

(ii) a coating on the underside of said paperboard layer, which coating is formed of plastic material which is compatible for heat sealing to an inner surface of said container body rim;

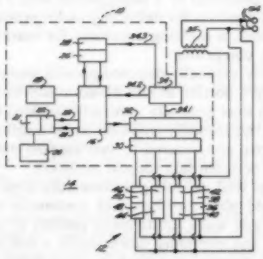
(d) said lid also including a molded plastic rim having:
(i) a horizontal flange, the underside of which is secured to a marginal area of the upper side of said central paperboard panel;
(ii) a skirt depending from the outer periphery of said rim;
(iii) a lip projecting radially inward from a lower extremity of said skirt and defining with portions of said skirt and said central panel an annular channel for receiving the rim of said container body;
(iv) said lid rim having a downwardly tapered inner portion whose underside is secured to said lid central paperboard panel to maintain an inward deflection of said panel;
(e) said lid rim lip having a sharp pointed inner peripheral edge adapted to bite into said container rim to maintain said lid and container body rims in sealing engagement with each other even when the said lid central paperboard panel is deflected out of its normal horizontal plane by internal gas pressures generated within said container.

4,442,972

ELECTRICALLY CONTROLLED PROGRAMMABLE DIGITAL THERMOSTAT AND METHOD FOR REGULATING THE OPERATION OF MULTISTAGE HEATING AND COOLING SYSTEMS

Bharat B. Sahay, Johnson City, and James J. Jones, Elizabethton, both of Tenn., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 14, 1981, Ser. No. 301,783
Int. Cl.³ F23N *5/20*
U.S. Cl. 236—1 EA **8 Claims**



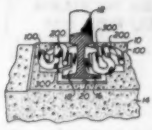
1. Thermostat means for regulating a temperature conditioning system having independently operable main and auxiliary temperature conditioning means comprising means for sensing the temperature in a zone whose temperature is to be conditioned, means for scheduling temperatures to be provided in the zone during respective periods of time in a selected time sequence, and control means responsive both to the temperature sensing and scheduling means for operating the main temperature conditioning means when required in any of said time periods either to maintain a scheduled temperature in a period or to initiate conditioning of the zone temperature to provide the zone temperature scheduled to be provided in a next scheduled time period, said control means being responsive to the temperature sensing and scheduling means for comparing the zone temperature being provided in a time period with a temperature scheduled to be provided in that period, for comparing the zone temperature in any of said time periods with the temperature scheduled to be provided in the zone in the next scheduled time period in said time sequence to determine a time period when any operation of the main temperature conditioning means is required to be initiated for conditioning the zone temperature at a predetermined and desired rate of change of zone temperature to provide said next scheduled zone temperature at the start of said next time period, and to operate the main temperature conditioning means when required to maintain said scheduled zone temperature or at said determined time to initiate conditioning of the zone temperature to provide said next scheduled temperature, said control means being further responsive to the temperature sensing means for determining the actual rate of change of temperature then effected in the zone by the temperature conditioning means of the system during any operating thereof and for operating the auxiliary temperature conditioning means to aid the main temperature conditioning means in conditioning zone temperature only when said actual rate of change of zone temperature is less than said predetermined and desired rate of change of zone temperature.

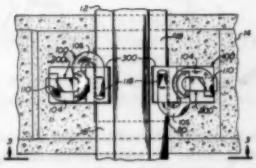
4,442,973

RAIL FASTENING ASSEMBLIES

Graham M. Fee, Geneva, Ohio, assignor to True Temper Railway Appliances, Inc., Chicago, Ill.

Continuation of Ser. No. 933,630, Aug. 14, 1978, abandoned.
This application Jan. 27, 1981, Ser. No. 228,804
Int. Cl.³ E01B *9/30*
U.S. Cl. 238—349 **5 Claims**





1. An S-shaped torsional spring railway rail clip, adapted to be rotated onto the upwardly projecting head of a cooperating chair, for securing a railway rail to an anchoring support therefor, said rail clip comprising:
(a) a sigmoidal central leg;
(b) a tie anchor portion comprising a first loop defined by a tie anchor arcuate leg and a tie anchor terminal leg having an upwardly divergent free distal end, said tie anchor portion extending from a first end of said central leg and lying on one side thereof; and,
(c) a rail bearing portion comprising a second loop defined by a rail bearing arcuate leg and a rail bearing terminal leg having an upwardly divergent free distal end, said rail bearing portion extending from the second end of said central leg and lying on the opposite side from said tie anchor portion to yield a generally S-shaped geometry;
wherein holding power of the clip is achieved predominantly by torsional force.

3. A rotatable rail fastening assembly for securing a railway rail, having laterally projecting base flanges, to an anchoring support therefor, said assembly comprising:
(a) a generally S-shaped torsional spring rail clip including a generally sigmoidal central leg, a tie loop having an arcuate portion extending from a first end of said central leg and a distal portion, and a rail loop having an arcuate portion extending from the second end of said central leg and a distal portion; and,
a chair positioned adjacent a railway rail having anchoring means for securing said chair to a support for said rail and

head means for engagement with said rail clip, wherein said head means includes jaw means for receiving at least a portion of said central leg, for providing a downward restraining force thereon when said clip is rotated into engagement with said chair and for positioning the distal portion of said rail loop on the base flange of said rail, and ramp ledge means for establishing an upwardly directed force on the distal portion of said tie loop when said clip is rotated into engagement with said chair;

wherein rotating said clip into engagement with said chair causes the establishment of a rail-holding effective torsional force on said central leg.

4,442,974

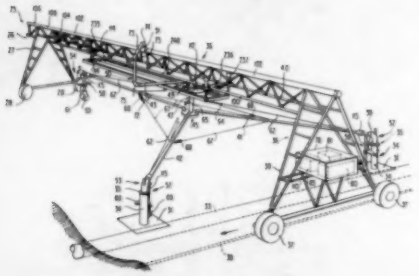
LAND IRRIGATION SYSTEM AND METHOD

Allen T. Noble, Boise, Id., assignor to Noble Linear Irrigation, Inc., Boise, Id.

Continuation-in-part of Ser. No. 18,013, Mar. 6, 1979, abandoned, which is a continuation-in-part of Ser. No. 923,291, Jul. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Jan. 30, 1980, Ser. No. 116,874

Int. Cl.³ B05B *3/18*

U.S. Cl. 239—1 **30 Claims**



18. For use in connection with a land irrigating system in which a moving water sprinkler means having water inlet means at one point extends laterally to and moves along the length dimension of a stationary water supply means having a plurality of water outlet valve means at equally spaced points along the length thereof, an apparatus for successively connecting water outlet valve means of the stationary water supply means with water inlet means of the sprinkler means comprising

conveyance means for moving along the length dimension of the stationary water supply means at the same overall rate of movement as the moving sprinkler means,

three elongated water conduit means radially disposed at 120° to each other, each elongated water conduit means being rigid from one end portion to the other end portion,

pivotal support means carried by the conveyance for pivotally supporting the elongated water conduit means by the conveyance means for rotation of each elongated water conduit means around one end portion of the elongated water conduit means,

water flow conduit means connecting the one end portion of each elongated water conduit means for uninterrupted water flow to the inlet of the sprinkler line as the elongated water conduit means rotates,

connecting means at the other end portion of each elongated water conduit means for rotational water flow connection with successive water outlet valve means,

water flow control means for closing each elongated water conduit means, and

movable support means for mounting the pivotal support means for movement toward and away from the stationary water supply means during movement of the conveyance means along the length dimension of the stationary water supply means to accommodate the length of an elongated water conduit means while an elongated water conduit means is connected to one of said water outlet valve means.

4,442,975

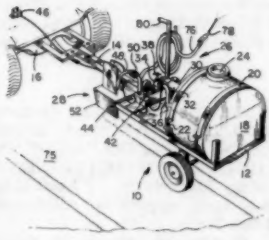
STRIPING APPARATUS FOR MARKING SURFACES

Ralph W. Long, 53 Elm St.; Charles B. Smith, Rte. 2, Box 390, and Don E. Baer, 1520 Peterson Dr., all of Wabash, Ind. 46992

Filed Mar. 11, 1982, Ser. No. 356,956

Int. Cl.³ B05B *1/28*

U.S. Cl. 239—150 **12 Claims**



1. In combination with a wheeled platform having a container mounted thereon for containing a marking fluid and adapted to be propelled by a prime mover over a surface, and means on said platform for delivering under pressure the fluid in said container, a marking apparatus for marking surfaces with the fluid, comprising:

two generally vertically disposed parallel support members embracing a portion of said platform and having aligned elongated slots generally vertically disposed therein,

a generally horizontally disposed plate member having a hole therein and secured to said support members with said hole between said support members,

a continuous wall extending downwardly from the periphery of said plate member, said continuous wall having opposite side walls substantially parallel to said support members and extending downwardly a first length from said plate member, and front and back walls joining said side walls and extending downwardly from said plate member a second length less than said first length,

a bolt received through a hole in said platform portion and through said slots, and a fastener threadedly received on one end of said bolt for adjustably securing said support members to said platform portion, and

a nozzle means connected to said delivering means and received through and secured in said hole in said plate member, said nozzle means being adjustably positioned angularly and in elevation relative to the surface to be sprayed by adjustment of said support members.

4,442,976

SUPPORT STRUCTURE FOR LAND IRRIGATION SYSTEM

Allen T. Noble, Boise, Id., assignor to Noble Linear Irrigation, Inc., Boise, Id.

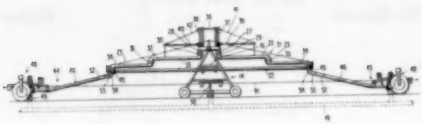
Continuation-in-part of Ser. No. 146,122, May 2, 1980, abandoned, which is a continuation-in-part of Ser. No. 80,060, Sep. 28, 1979, Pat. No. 4,274,584, which is a continuation-in-part of Ser. No. 887,792, Mar. 17, 1978, abandoned. This application Aug. 31, 1981, Ser. No. 297,557

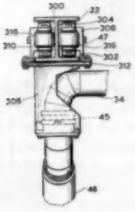
Int. Cl.³ B05B *3/18*

U.S. Cl. 239—183 **7 Claims**

1. In a land irrigation system including a water main having a plurality of water hydrants projecting upwardly from the

water main at spaced points along its length, an elongated sprinkler line extending transversely to the length dimension of the water main, tractor means movable along said water main and coupled to said sprinkler line, means responsive to said tractor means for moving the sprinkler line along the water main, an elongated conduit having an elongated inner end portion and an outer end portion, providing means for providing the inner end portion to be in fluid communication with the sprinkler line, a swivel coupling connecting the providing means and the inner end portion of said elongated conduit, wheeled carriage means for providing the outer end portion to be in fluid communication with a water hydrant for supplying water to the sprinkler line, and drive means for moving the





carriage means from hydrant to hydrant, the improved providing means comprising:

an elongated track extending generally in the direction of the axis of the water main;

means for supporting the elongated track for movement with the sprinkler line at a height above the water hydrants; and

support means moveably suspended from the track and connected to said elongated conduit at said swivel coupling for supporting said inner end portion and said swivel coupling for movement directly beneath the track during all movement of the support means along the track, thereby minimizing twisting moments on the track.

4,442,977

AIRLESS ELECTRIC SPRAYER

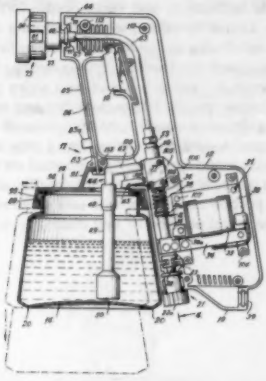
John L. Beiswenger, Grayslake; Frank A. Smiesko, McHenry, and Dhananjay V. Chaphalkar, Lindenhurst, all of Ill., assignors to Acme Burgess, Inc., Grayslake, Ill.

Filed Jan. 25, 1982, Ser. No. 342,262

Int. Cl.³ B05B *9/04*

U.S. Cl. 239—332 **11 Claims**

1. In an airless electric sprayer having a housing; a liquid flow assembly mounted within and fastened to said housing and including a pump, liquid siphon means connected to the inlet of said pump and spray nozzle means connected to the outlet of said pump; an electric motor mounted within said housing and operatively connected with said pump to drive the same; and receptacle means supported by said housing and into which said siphon means extends; the improvement wherein said receptacle means comprises a receptacle having an open top and a closure therefor, said closure being a part separate from and including no part of said housing or other sprayer structure, said closure comprising means for closing attachment to said top of said receptacle, said closure and said housing having respectively interacting means for supporting said receptacle means from said housing in detachably locked engagement therewith, said interacting means comprising a lid portion on said closure, said lid portion having a hole therein, and said closure having a superstructure integral with said closure and above said hole, said superstructure having sidewalls and an open top, and a horizontal canopy and horizontal side shelves coplanar with said canopy extending inwardly



from the top edges of said sidewalls, said interacting means further comprising, as a part of said housing, bracket and shoulder structures defining spaces into which said canopy and side shelves can horizontally slide to support said closure in said housing, said receptacle means being separately removable from said housing.

4,442,978

FUEL INJECTION NOZZLE FOR INTERNAL COMBUSTION ENGINES

Kurt Seifert, Esslingen-Zollberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

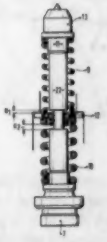
Division of Ser. No. 210,638, Nov. 26, 1980, Pat. No. 4,344,575, which is a continuation of Ser. No. 24,818, Mar. 28, 1979, abandoned. This application Jul. 21, 1982, Ser. No. 400,205

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2825982

The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.

Int. Cl.³ B05B *1/32*

U.S. Cl. 239—453 **3 Claims**



1. A fuel injection nozzle for internal combustion engines comprising a nozzle body, a bore in said nozzle body, an insert including a valve seat disposed in said nozzle body on an outer end of said bore, said insert including a tubular body extension, a valve needle guided by said tubular body extension, said valve needle having a terminal head portion which cooperates with said valve seat for fuel passage, said valve needle adapted

to open in the fuel flow direction against the force of at least one closing spring means, said valve needle further including an annual cylindrical shoulder positioned upstream of said terminal head portion in cooperation with said tubular body extension to form a throttle point for controlling fuel flow in accordance with the stroke of said valve needle, said throttle point being effective in an initial opening stroke and subsequently made ineffective, said valve needle further being arranged to be loaded by said at least one closing spring means, said at least one closing spring means including first and second mutually associated pre-stressed closing springs for causing a sudden increase in closing force of said valve needle subsequent to an initial opening stroke, said first and second closing springs being disposed coaxially relative to each other and to said valve needle, said first spring being supported on said insert and said second spring being supported on means associated with an opposite end of said valve needle, and said valve needle head portion cooperates with said valve seat for predetermining the initial position of said closing springs.

4,442,979

SPREADER VEHICLE FOR SOLID AND LIQUID THAWING MATERIALS

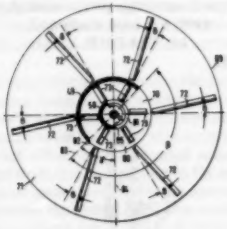
Willy Küpper, Eichhölzleweg 11, D-7715 Bräunlingen, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,166

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1980, 3035360

Int. Cl.³ E01C *19/20*

U.S. Cl. 239—656 **27 Claims**



1. A spreader device comprising a frame a distributor plate mounted for rotation about a vertical axis on said frame, drive means connected to said distributor plate for rotating said distributor plate, said distributor plate including on a top surface thereof, a plurality of impellers, an inner downpipe concentrically positioned about said vertical axis and defining a liquid supply conduit for supplying a liquid thawing material to said distributor plate, an outer downpipe positioned concentrically around said inner downpipe positioned concentrically around said inner downpipe defining an annular space therewith acting as a granulated material supply conduit for supplying granulated thawing material to said distributor plate.

4,442,980

PROCEDURE AND MECHANISM FOR THE AUTOMATIC CONTROL OF A GRINDING MILL ROLLER CARRIAGE EQUIPPED WITH A REGULATED PRODUCT FEED

Hans Oetiker, St. Gallen; Robert Linzberger, Abtwil; Leendert Ketting, Oberuzwil, and Werner Winteler, Oberhelfenschwil, all of Switzerland, assignors to Bebruder Buhler AG., Unzwil, Switzerland

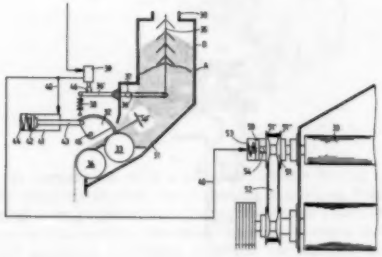
PCT No. PCT/CH80/00151, 371 Date Nov. 9, 1981, 102(e) Date Nov. 9, 1981

PCT Filed Dec. 5, 1980, Ser. No. 321,165

Claims priority, application Switzerland, Apr. 11, 1980, 2796/80

Int. Cl.³ B02C *25/00*

U.S. Cl. 241—34 **7 Claims**



1. In an improved system for use in a grinding mill for automatically controlling an operating condition controllable between first and second states, said system including position adjustable regulating means for regulating the operating condition; a fluid operated servomechanism operatively connected to said regulating means for adjusting its position and having an inlet and outlet; sensing means responsive to the operating condition for positioning an indicating portion of said sensing means in dependence upon said operating condition; valve means interposed between said servomechanism and a source of compressed fluid for controlling the supply of fluid thereto, said valve means including actuator means operatively connected to said indicating portion and responsive to the position thereof for moving between a first position and a second position as said operating condition varies between said first and second states; valve inlet means for connection to said source, and a valve outlet connected to said servomechanism inlet; the improvement comprising:

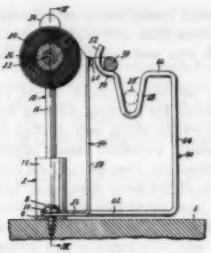
said valve means having means responsive to the first position of said actuator means for producing a first operational mode wherein said valve inlet is blocked and said valve outlet is vented, means responsive to a position of said actuator intermediate said first and second positions for producing a second operational mode wherein both said valve inlet and outlet are blocked, and means responsive to the second position of said actuator for producing a third mode of operation wherein said valve inlet and outlet are connected with each other; and

means for mechanically coupling said valve means to the regulating means so that a change of the regulating means position causes a corresponding movement of the valve relative to said indicating portion in a direction tending to urge said actuator to said intermediate position.

4,442,981
FISHING ROD WRAPPING DEVICE

James R. Cope, 10500 Cherokee La., Leawood, Kans. 66206

Filed May 28, 1982, Ser. No. 383,018
Int. Cl.³ B65H *81/06*
U.S. Cl. 242—7.19 2 Claims

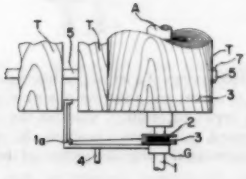


1. A fishing rod wrapping device comprising:
a. a frame,
b. spool support means carried by said frame and operable to support a spool of wrapping thread for rotation on its axis, and
c. fishing rod support means carried by said frame and operable to support a fishing rod in parallel relation to but laterally spaced apart from the axis of said spool, for free manual rotation about its axis and longitudinal movement parallel to its axis, said fishing rod support means comprising a pair of support members carried by said frame and spaced apart axially of a thread spool carried by said spool support means, said support members each having a generally horizontal rest portion on which said fishing rod may rest freely for manual rotation and longitudinal movement, each of said rod supporting members being provided additionally with locking means operable by manual movement of said rod relative to said support members to lock said rod against free rotation and longitudinal movement, whereby to preserve the existing thread tension and rod position in the event it may be desired to interrupt the wrapping process.

4,442,982
VENEER REELING UNIT

Yasuhiko Iwamoto, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Japan

Filed Dec. 4, 1981, Ser. No. 327,488
Claims priority, application Japan, Dec. 9, 1980, 55-174117
Int. Cl.³ B65H *17/08, 75/02*
U.S. Cl. 242—55 4 Claims

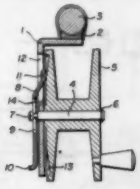


1. A veneer reeling unit for reeling veneer sheets successively together with at least one strand of thread for guiding and supporting said veneer sheets round a rotated reeling roll disposed with its axis extending substantially in parallel to the grain of said veneer sheets, comprising:
a thread storage member for containing therein said thread in the form of a winding and allowing said thread to be paid out therefrom, and
a thread guiding member for guiding said thread in such a way that the thread may be wound up with said veneer sheets around said reeling roll,
said thread storage member and thread guiding member being so arranged that they are moveable integrally with said reeling roll as a unit.

4,442,983
FISHING REEL WITH ADJUSTABLE DRUM BRAKE

Robert Moll, Chéserex, Switzerland, assignor to Etablissement Liotte Rep. Etrangenes, Vaduz, Liechtenstein

Filed Apr. 9, 1982, Ser. No. 367,062
Claims priority, application Switzerland, Apr. 13, 1981, 2435/81
Int. Cl.³ A01K *89/02*
U.S. Cl. 242—84.51 R 3 Claims

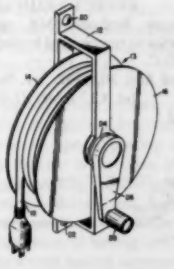


1. A fishing reel comprising a support designed to be affixed to a fishing rod, a drum having two side cheeks and on to which a fishing line is wound, means for rotatably mounting said drum on said support, and an adjustable brake device for said drum, said brake device comprising a slider lodged in a radial slot for radial adjustment with respect to said drum, said slider having a resilient end portion arranged to bear against a substantially flat outer surface of one of the cheeks of said drum, said cheek surface which interacts with the slider having a number of notches evenly distributed over an annular zone of the said outer surface of the cheek, each of these notches, oriented radially, having an elongated shape and a depth which increases continuously in the radial direction, towards the periphery of the said cheek so that a braking effect is exerted which varies in accordance with the distance of the resilient end portion of the slider from the axis of the drum.

4,442,984
ELECTRIC CORD REEL

Bijan Bayat, 1717 Jasmine Cir., Plano, Tex. 75074

Filed Mar. 19, 1982, Ser. No. 359,805
Int. Cl.³ B65H *17/52*
U.S. Cl. 242—106 3 Claims



1. An electric cord reel for temporary storage of an electric extension cord, said cord reel comprising:
a rectangular frame structure;

a spool pivotally mounted to said rectangular frame structure including a central hub section and opposing end plates disposed at opposite ends of said central hub;

a crank fixedly mounted to said central hub for rotating said spool upon operation thereof; and

a pair of flexible protuberances readily disposed outward from said central hub for receiving and releasably retaining at least one end of an electric extension cord.

4,442,985

APPARATUS FOR CONTROLLING A WEB TRANSPORT SYSTEM

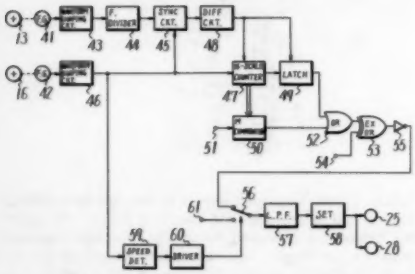
Yoshio Kishi, Yokohama, and Norichika Mine, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,158

Claims priority, application Japan, Apr. 6, 1981, 56-51331

Int. Cl.³ B65H *77/00;* **G11B** *15/28, 15/32, 15/43*

U.S. Cl. 242—186 **25 Claims**



1. Apparatus for controlling a web transport system of the type having supply and take-up reels for supplying and taking up said web, respectively, tension control means for controlling the supply and take-up tension of said web, web drive means operatively driven for moving said web, and sense means for sensing the movement of said web, said apparatus comprising web drive detecting means for detecting the operation of said web drive means; comparator means coupled to said sense means and said web drive detecting means for comparing the movement of said web and the operation of said web drive means to indicate when said web moves at a rate different from the rate at which said web drive means is driven; and adjusting means coupled to said comparator means for adjusting said tension control means when said web moves at a rate different from the operating rate of said web drive means.

4,442,986

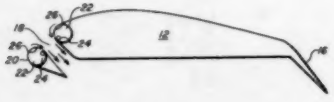
LEADING EDGE AUGMENTOR WING-IN-GROUND EFFECT VEHICLE

David G. Rousseau, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1982, Ser. No. 413,182

Int. Cl.³ B64C *21/04*

U.S. Cl. 244—12.1 **2 Claims**



1. A ground effect vehicle comprising:

an aerodynamic body including two wings extending in opposite directions from the sides of said body;

each of said wings being formed of a main part and a stationary leading edge part separated by a wing opening;

said main part and said leading edge part each enclosing a conduit extending the spanwise length of said part adjacent said wing opening;

each of said conduits having a conduit opening in the form of a slot extending spanwise along said conduit and into said wing opening;

at least one engine being connected at the exhaust end to said conduits so that efflux from said engine is ducted through said conduits and into said wing opening through said conduit opening;

said wing opening varying in width along its spanwise length to compensate for varying sizes of wing surface and pressure differentials along said conduit opening;

said conduits containing deflector means mounted within said conduits to direct the flow out of said conduit opening along the walls of the wing opening so that said flow forms a boundary layer along said walls creating a Coanda effect and entraining ambient air to flow with said boundary layer through said wing opening and under said wing; and

each of said wings further containing an end plate extending downwardly from the ends of said wings and a trailing edge portion extending downwardly from the rear edge of said wings, wherein said end plate and trailing edge part contain most of the flow from said wing opening to form a cushion which supports said wing in ground effect, but where some of the flow escapes beneath the trailing edge part to provide forward thrust.

4,442,987

GUIDANCE DEVICE FOR THE MOVING FAIRING OF A THRUST REVERSER SYSTEM

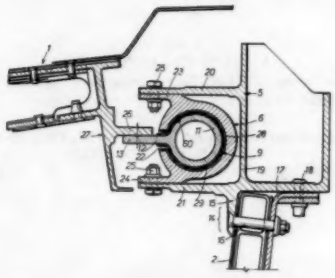
Paul J. Legrand, Vaux le Penil, and René M. J. Hersen, Combs la Ville, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.", France

Filed Dec. 16, 1981, Ser. No. 331,230

Claims priority, application France, Dec. 23, 1980, 80 27281

Int. Cl.³ B64D *33/04;* **F02K** *1/54*

U.S. Cl. 244—110 B **8 Claims**



1. In a thrust reverser system of a jet engine having a stationary casing attached to a mast and a section of a nacelle fairing movable between a deployed position, wherein the thrust of the jet engine is reversed, and a stowed position, the improved means for slidably mounting the movable section of the nacelle fairing comprising:

(a) a pair of upper guide pieces, each guide piece defining a longitudinal groove having a generally circular cross-section and a slot extending through a wall along the length of the upper guide piece, the plane of the slot being approximately perpendicular to a median vertical plane of the nacelle;

(b) first means to attach the upper guide pieces to an upper

portion of the stationary casing such that the slots open in opposite directions;

(c) a pair of lower guide pieces, each guide piece defining a longitudinal groove having a generally circular cross-section and a slot extending through a wall along the length of the lower guide pieces, the plane of the slot being approximately pependicular to a median vertical plane of the nacelle;

(d) second means to attach the lower guide pieces to a lower portion of the stationary casing such that the slots open in opposite directions;

(e) a pair of upper guided elements having generally circular cross-sections, one of the upper guided elements slidably disposed in each of the grooves in the upper guide pieces, each of the upper guided elements having a radial flange extending from its periphery through the slot in the upper guide piece;

(f) means to attach the flanges of the upper guided elements to an upper portion of the movable nacelle portion;

(g) a pair of lower guided elements having generally circular cross-sections, one of the lower guided elements slidably disposed in each of the grooves in the lower guide pieces, each of the lower guided elements having a radial flange extending from its periphery through the slot in the lower guide piece;

(h) means to attach the flanges of the lower guided elements to a lower portion of the movable nacelle portion; and,

(i) friction reducing means interposed between the upper and lower guided elements and the surfaces of the grooves in the upper and lower guide pieces to reduce the sliding friction therebetween.

4,442,988

INFORMATION TRANSMISSION DEVICE THROUGH THE RAILS BETWEEN A RAILWAY TRACK AND A VEHICLE ASSEMBLY CIRCULATING ON THIS TRACK

Daniel M. Laurent, Paris, and Claude Thézé, Montigny les Cormeilles, both of France, assignors to Jeumont-Schneider Corporation, Puteaux, France

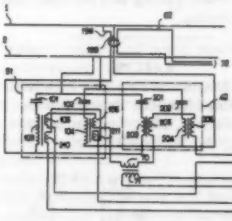
PCT No. PCT/FR81/00042, 371 Date Nov. 16, 1981, 102(e) Date Nov. 16, 1981, PCT Pub. No. WO81/02714, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 24, 1981, Ser. No. 322,016

Claims priority, application France, Mar. 25, 1980, 80 06570

Int. Cl.³ B61L *21/00, 3/00*

U.S. Cl. 246—34 CT **7 Claims**



7. For use in apparatus for transmission of information through the rails between a railway track and a set of vehicles circulating in the same direction on that track, and along which track there are, in succession, a number of information transmission zones, resonant circuit means tuned to a carrier frequency and connected between the rails of the track at each end of each information transmission zone, the successive information transmission zones having different carrier frequencies, and the resonant circuit means connected respectively downstream of one information transmission zone and upstream of the immediately adjacent zone each comprising a series resonant circuit, said series resonant circuits being tuned to said different carrier frequencies, respectively, and each having capacitance connected in series with the primary winding of a transformer, the secondary windings of the two transformers being connected in series between output terminals through the intermediary of the secondary winding of a further transformer having a primary winding to which is applied an alternating signal such that an alternating signal representative of the failure of one of said resonant circuits appears at said output terminals and enables determination of said one circuit.

4,442,989

CABLE BEARER SYSTEM

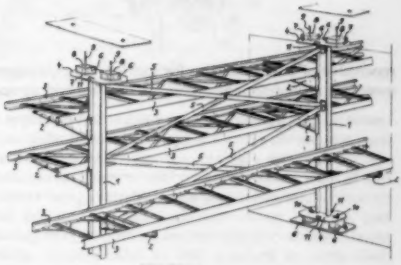
Bernd Hartmann, Hülsbergstr. 51a, 4630 Bochum, Fed. Rep. of Germany

PCT No. PCT/DE79/00042, 371 Date Dec. 18, 1979, 102(e) Date Dec. 10, 1979

PCT Filed Apr. 18, 1979, Ser. No. 196,486

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—49 **16 Claims**



1. Cable bearer system for rendering earthquake-proof nuclear power stations and, the like consisting of I-shaped bearers arranged vertically at intervals rearwardly of one another in the linear direction of the cable system and a plurality of brackets fixed to the bearers of the bearer system and which extend horizontally from the bearer sides, the bearers having holding plates at their ends which can be fastened to an adjacent building construction and at least two adjacent bearers being hung and braced together to form a rigid unit so that the holding plates are fastened to the building construction by intermediate spring elements which are omnidirectionally effective and absorber elements which are unidirectionally effective.

4,442,990

PIPE SUPPORT DEVICE FOR PLASTIC PIPE

Guenther Krueger, 16 Bristol Ct., Berkeley Heights, N.J. 07422

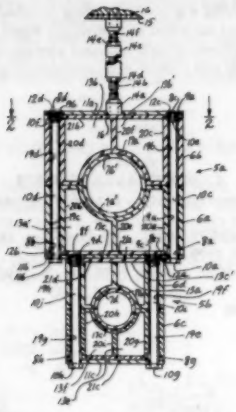
Filed Jun. 30, 1982, Ser. No. 393,666

Int. Cl.³ F16L *3/22*

U.S. Cl. 248—62 **14 Claims**

1. A support device for supporting a plastic pipe in a substantially horizontal position, comprising in combination: a pipe-support element having a pipe-supporting smooth surface extending substantially linearly in direction transverse to the pipe-support element substantially parallel with a longitudinal axis of pipe to be supported thereon, and extending arcuately and concavely forming a concave seat for a pipe to be supported thereon, and body material having said pipe-supporting surface being formed as a wall having an opposite surface and extending into surrounding walls substantially outwardly-extending from edges of said opposite surface forming at least one spacious cavity having at least one outer-spaced opening thereto formed by said surrounding walls, and said surround-

ing walls having at least two spaced-apart through-apertures one on each of opposite-locations relative to said concave seat,



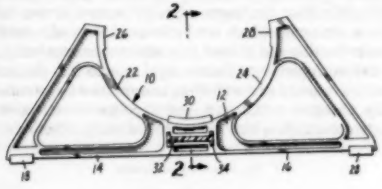
receivable of a bolt element for locking the pipe-support element into a predetermined position on a support structure.

4,442,991

CRADLE FOR STOWING CYLINDRICAL TANK

Dennis L. Levens, Rte. 2, Hudson, Wis. 54016

Filed Feb. 8, 1982, Ser. No. 346,398
Int. Cl.³ A47G *23/02*
U.S. Cl. 248—146 **7 Claims**



1. A cradle for stowing a cylindrical tank, which cradle comprises

a pair of yokes, of elastic material each having

a nonarticulated framework of two coplanar triangles joined at apexes, one pair of legs forming a generally straight line at the base of the yoke and another pair curving inwardly to form a generally semi-cylindrical fork,

a foot near each end of the base,

facing protuberances at the ends of the fork that are spaced apart approximately the diameter of the tank,

a cushion projecting inwardly from the center of the fork,

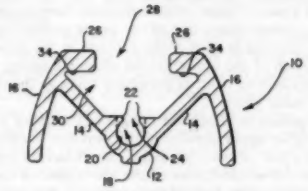
a beam rigidly connecting the bases of the yokes to be upstanding when the feet rest on a flat surface, which feet project below the yokes and the beam in the direction of the flat surface to hold said framework and beam above that surface so that the forks provide a cradle for the tank which rests on the cushions, and the tank tends to bow the base and to pinch the tank between the protuberances.

4,442,992

MODULAR SHELF SUPPORT

Anthony C. Worrallo, 15, Spott Rd., Kohrimarama, Auckland 5, New Zealand

Filed Dec. 11, 1981, Ser. No. 329,890
Claims priority, application New Zealand, Dec. 11, 1980, 195809
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—243 **6 Claims**



1. A support system, comprising

a one-piece, unitary, elongated structural element having

a core structure,

two webs extending outwardly from said core structure,

a first pair of lips on outer ends of said webs directed toward but spaced from one another, and defining a first slot therebetween,

a first elongated cavity defined by and between said first lips, said webs and said core structure,

a second elongated cavity in said core structure defined by a second pair of opposed and spaced lips extending into said first cavity adjacent junctures of said core structure and said webs, and

at least one widening in said second pair of lips forming a transverse surface; and

a bracket having

a head receivable in said first cavity,

a protruding boss extending from said head and receivable in said widening in engagement with said transverse surface, and

a neck receivable in said first slot and connecting said head to support structure extending exteriorly of said structural element;

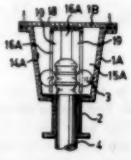
whereby said boss engages said transverse surface preventing movement of said bracket along said element once said boss is inserted in said widening.

4,442,993

CEILING SUSPENSION DEVICE

C. C. Tseng, 167 Ning Hsia Rd., Taipei, Taiwan

Filed Jan. 28, 1982, Ser. No. 343,600
Int. Cl.³ A47H *1/10*
U.S. Cl. 248—327 **2 Claims**



1. A ceiling suspension device comprising a hollow inverted frustoconical housing having an externally flanged open-ended top and a base with a circular center opening for insertion therein of a suspension pole, a centrally defined passage of decreasing cross section from the top opening of the housing to the circular center opening in the base thereof, a releasing

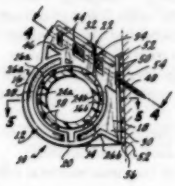
means including a disc having a concentric circular opening and a plurality of evenly spaced, integral elastic arms clustering about the circular opening in the disc and projecting upwardly and outwardly therefrom with the free end of each arm being bent outwardly to form a tab parallel to the disc, said elastic arms being adapted to be inserted through the opening in the base of the housing to be suspended from the housing by means of the tabs resting on the base thereof and being capable of axial movement relative to the housing; a plurality of balls adapted to be received within the housing; and a suspension pole adapted to be inserted through the circular opening in the disc of the releasing means into the passage in the housing, said suspension pole having means for causing converging or diverging movement of the balls for causing multilateral clamping or loosening action of the balls, and a ball restricting means including a circular cover plate having a diameter exactly the same as the outer diameter of the flange of the housing, a plurality of evenly spaced, elongate divider plates positioned centrally of the cover plate and extending from the undersurface thereof toward the base of the housing to define a generally cylindrical passage for receiving the suspension pole, a plurality of slits each being defined between adjacent divider plates, and a ball receiving chamber which is defined between the cylindrical passage and the inner periphery of the housing when the ball restricting means is laid over the housing, said chamber and cylindrical passage communicating through the slits such that the balls received in the chamber are evenly spaced apart by the divider plates and extend partially through tne respective slits.

4,442,994

PIPE HANGER CAPABLE OF TOTALLY ENCIRCLING A PIPE

Duane D. Logsdon, P.O. Box 186, Stanton, Calif. 90680

Filed Feb. 2, 1982, Ser. No. 345,198
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—547 **7 Claims**



1. A pipe hanger capable of being attached to a support surface which comprises:

a body, said body having a wall, said wall formed as a loop surrounding an aperture, said wall including an interstice opening into said aperture, the portions of said wall located adjacent to said interstice forming a first wall end and a second wall end;

said body including a foot joined to said wall, said first wall end located in association with said foot;

said body including a passageway having a first portion passing through said second wall end and a second portion passing through said first wall end and said foot, said passageway capable of receiving an elongated essentially cylindrical fastening means of a greater length than the length of said passageway and when said fastening means is located in said passageway a portion of said fastening means holding said first and said second wall ends in fixed association with one another and a further portion of said fastening means extending from said passageway beyond said foot and into said support surface to hold said body fixedly fastened to said support surface when said body is located with said foot abutting against said support surface;

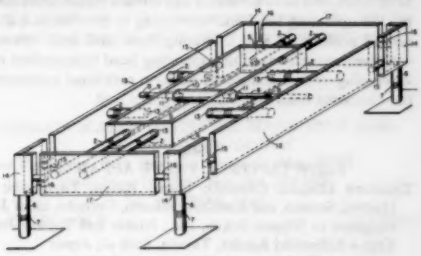
said passageway being oriented acutely with respect to at least a portion of said foot such that when said fastening means is located in said passageway said portion of said fastening means extending beyond said foot is located at an acute angle with respect to at least said portion of said foot.

4,442,995

MACHINE FOR CONCRETE MOLDING

Clyde C. Grady, II, 4914 Deerwood Cir., Baytown, Tex. 77521

Continuation-in-part of Ser. No. 3,723, Jan. 15, 1979, Pat. No. 4,253,636. This application Apr. 25, 1980, Ser. No. 143,775
Int. Cl.³ B28B *7/06, 1/08*
U.S. Cl. 249—139 **4 Claims**



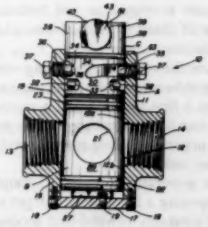
1. An apparatus for molding concrete comprising a substantially rectangular frame comprised of four corner members and four side members, said apparatus having a side member disposed between each two of said corner members, each of said side members being rotatable about supporting shafts between each said side member and each said corner member, said frame having an open bottom, each of said side members being substantially perpendicular to and attached to expandable members, where each said expandable member is disposed between and attached at either end of its extremity to a said side member and a mold side, respectively, where expansion and contraction of each said expandable member moves the mold side to which it is attached in a direction substantially perpendicular to the axis of rotation of the side member to which it is also attached.

4,442,996

TAPERED ROTARY PLUG VALVE

Robert L. Erwin, deceased, Farmington, N. Mex. (by Josiephine Reed Erwin, Personal Representative), assignor to Josiephine R. Erwin, Farmington, N. Mex., Personal Representative of Estate of Robert L. Erwin

Filed Mar. 8, 1982, Ser. No. 356,034
Int. Cl.³ F16K *31/44*
U.S. Cl. 251—77 **15 Claims**



1. A rotary plug valve comprising a tapered valve plug, valve plug actuating means including a rotary and axially movable plug operating head distinct from said valve plug, a valve casing including a tapered valve chamber for receiving

said tapered valve plug, said valve chamber having inlet and outlet ports communicating therewith and a first cylindrical extension for mounting said rotary and axially movable plug operating head for rotation and axial movement therein, cam means responsive to rotation of the operating head for imparting axial movement to the head when the head is rotated, said valve plug rotatably fitting within said tapered valve chamber and being provided with a transverse passage for communicating with the inlet and outlet ports when the valve is in open position, first means interconnecting the operating head and valve plug to provide axial movement to the plug when the head is axially moved by coaction of said cam means and said head when said head is rotated and second means interconnecting the operating head and valve plug to provide in a disconnected position of said operating head and said valve plug rotational movement of the operating head independent of the valve plug or in a connected position rotational movement of the operating head and valve plug as a unit.

4,442,997

FLOW CONTROL VALVE APPARATUS

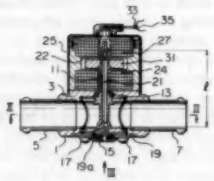
Takaharu Idogaki, Okazaki; Hisasi Kawai, Toyohashi; Kyo Hattori, Susono, and Kazuhiro Sakurai, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

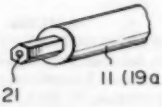
Filed Nov. 23, 1981, Ser. No. 324,087

Claims priority, application Japan, Dec. 26, 1980, 55-183704

Int. Cl.³ F16K *31/08*

U.S. Cl. 251—129 **6 Claims**





6. A valve apparatus comprising:

a housing;

inlet means for introduction of fluid into said housing;

outlet means for discharging said fluid from said housing;

valve means arranged in said housing for controlling the amount of fluid flowing from said inlet means to said outlet means;

shaft means for rotatably coupling said valve means to said housing whereby said valve means is rotatably movable between a first position and a second position;

a torsion bar for generating a torsional force in a direction which urges said shaft means rotatably toward said first position; and

means for generating an electro-magnetic force in a direction opposing a force which urges said valve means to be moved rotatably toward said second position;

said shaft means and said housing having spaced apart crimped portions for coupling said shaft means and said housing to respective ends of said torsion bar, each of said crimped portions having a predetermined cross-sectional polygonal configuration, said torsion bar having a round cross-sectional configuration, and a predetermined polygonal cross-sectional configuration in the vicinity of said crimped portions of said shaft means and said housing.

4,442,998

ELECTROMAGNETIC VALVE UNIT

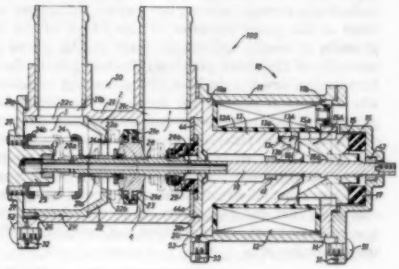
Tadashi Ohyama, and Shoji Kawata, both of Okazaki, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 169,458, Jul. 16, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,612

Claims priority, application Japan, Jul. 24, 1979, 54-94588; Jul. 24, 1979, 54-102926[U]

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—129 **1 Claim**



1. An electromagnetic valve unit including a flow control valve assembly or controlling the flow of fluid passing therethrough and operatively associated with an electromagnetic motor assembly for actuating said valve assembly in response to an electric current applied thereto from an electric power source, said motor assembly comprising:

a cylindrical housing of magnetic material provided at opposite ends thereof with first and second fitting faces;

a solenoid coil concentrically assembled within said housing and connected to said electric power source;

a stationary core of magnetic material fixed to said first fitting face of said housing and surrounded by said solenoid coil;

an annular yoke member of magnetic material fixed to said second fitting face of said housing;

a movable core of magnetic material arranged to be axially moved between said stationary core and said yoke member and being operatively connected to said flow control valve assembly, said stationary core and said movable core have confronting ends;

resilient means for biasing said movable core toward said yoke member;

one of said confronting ends being formed therein with an annular recess of a V-shaped cross-section forming a cylindrical inner surface and a conical outer surface convergent toward the other end, and the other end further comprising an annular projection corresponding in cross-section with the cross-section of said annular recess and forming a cylindrical outer surface and a conical inner surface respectively disposed in a parallel relationship with said cylindrical inner surface and with said conical outer surface of said one end;

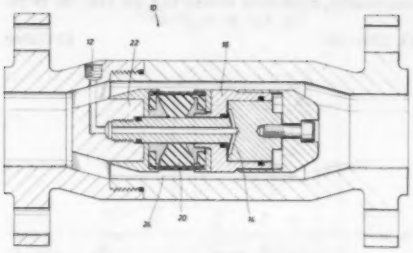
wherein said cylindrical inner surface is arranged to increase an annular area of said cylindrical outer surface overlapped therewith in accordance with axial displacement of said movable core toward said stationary core, and wherein the inner periphery of said yoke member is further arranged to increase an annular area of the outer periphery of the other end of said movable core overlapped therewith in accordance with the axial displacement of said movable core toward said stationary core.

4,442,999

REINFORCED PLUG FOR FLOW REGULATORS

Robert H. Welker, Sugar Land, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Jul. 22, 1982, Ser. No. 400,986
Int. Cl.³ F16K *31/12*
U.S. Cl. 251—358 **7 Claims**



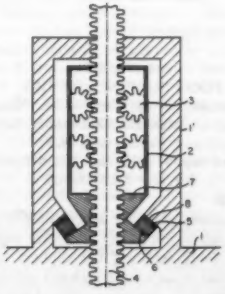
1. For use in a flow regulator having a resilient plug, a resilient plug construction which comprises a generally cylindrical, elongate body of resilient material adapted to be compressed between the ends thereof to expand radially outwardly to accomplish regulation in a flow regulator, and at least one ply of reinforcing material in said plug having a plurality of lengthwise fibers extending along the length of the plug wherein the fibers are anchored at opposite ends of the fibers by folding the fibers under into the body of the resilient plug, and further including means securing said fibers into a ply which is relatively nonyielding in a lengthwise dimension and which is yieldable to enable radial outward expansion of the plug during regulating.

4,443,000

FLEXIBLE COUPLINGS FOR MECHANICAL JACKING DEVICES USED IN THE INSTALLATION OF MARINE PLATFORMS

Jean F. Harvard, Carquefou, France, assignor to Brissonneau et Lotz Marine, France

Filed Dec. 28, 1981, Ser. No. 334,724
Claims priority, application France, Dec. 31, 1980, 80 27914
Int. Cl.³ E02B *17/04*
U.S. Cl. 254—89 R **4 Claims**



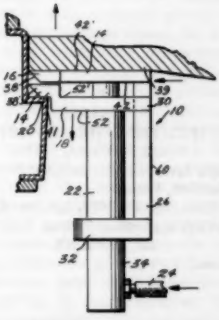
1. In a jacking mechanism of the rack and pinion gear type for the control and maintenance of the vertical positioning of a platform and the like on resting legs to which twin racks, with their teeth in opposition, are rigidly connected and form part of a jacking mechanism associated with at least one pair of pinions carried by means of a support-framework, and wherein each tooth of the pinions meshes respectively with one of the two sets of teeth of its corresponding rack in such a way as to be always in contact with one side or the other, with the pinions motor-rotatable to control the desired up or down movement of the racks, and wherein said legs have an upper part with an instantaneous center of rotation, the improvement of means at the bottom of the support-framework providing a first oblique-angle supporting surface; means connected with the main structure of the platform and providing a second supporting surface spaced from but substantially parallel to said oblique-angle surface; and flexible coupling means interposed in the space between and contacting said supporting surfaces for permitting relative freedom of movement between the support-framework and the platform structure, the coupling means having an axis of compression and being disposed so that the axis of compression is oriented to pass through the instantaneous center of rotation of the upper part of the said legs.

4,443,001

HYDRAULICALLY OPERATED HAND TOOL FOR FORCING OPEN DOORS

James P. Haerer, P.O. Box 134, Dunkirk, Md. 20754

Filed May 19, 1982, Ser. No. 379,918
Int. Cl.³ B66F *3/24*
U.S. Cl. 254—93 R **12 Claims**



1. A tool, for use with a hydraulic pump, for forcing or prying open doors and other objects, said tool comprising:

a first jaw member defining at least two spaced apart fingers;

a second jaw member defining at least three spaced apart fingers positioned and shaped to selectively mesh with said fingers of said first jaw member when said jaw members are positioned together;

a hydraulic piston-cylinder assembly for hydraulic connection to said pump and connected to said first and second jaw members;

a plate member defining opposed sides, said plate member connected to said first jaw member;

said second jaw member further defining first and second guide members, each of said guide members projecting adjacent respective sides of said plate member and in a slidable relationship with said plate member; and

a third guide member extending from said plate member and encircling a portion of said piston-cylinder assembly in slidable relationship with said assembly.

4,443,002

RACETRACK GUARD

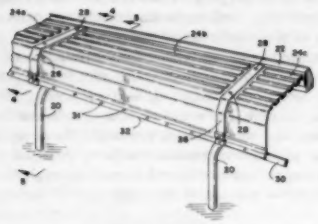
Richard Fontana, 8525 Bella Vista, Alta Loma, Calif. 91701

Filed Mar. 22, 1982, Ser. No. 360,231
Int. Cl.³ E04H *17/14*
U.S. Cl. 256—59 **18 Claims**

1. A racetrack guard comprising:

a plurality of spaced-apart fixed curved posts;

a rail attached to each post at its end;
a plurality of elongated panels arranged substantially from



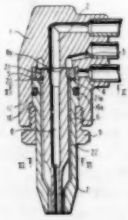
end to end and overlying said posts at said posts' upper curved portion; and,
means to attach said panels to said posts and to said rail.

4,443,003

BLOWTORCH CUTTING HEAD, PARTICULARLY FOR OXYGEN CUTTING

Christian Bleys, Livry, France, assignor to L. Sauvageau & Cie, Ozoir la Ferriere, France

Filed Sep. 17, 1982, Ser. No. 419,339
Claims priority, application France, Sep. 18, 1981, 81 17641
Int. Cl.³ B23K *7/00*
U.S. Cl. 266—48 4 Claims



1. Blowtorch cutting head, particularly for oxygen cutting, usable equally well with "head mixed" torches (1) and "premixing" torches (10), comprising a male part (6 or 6A) and a female part (7 or 7A), and characterized in that:

(a) the end of the male part in contact with the torch (1 or 10) has a flange (20 or 20A) the diameter of which is less than that of the chamber (5 or 14) into which open either the conduits (3 and 4) for the heating oxygen and gas for a "head mixed" torch, or the conduit (12) for oxygen/gas mixture of a "premixed" torch, and which is traversed by at least two diametrically opposed holes (21 or 21A);

(b) between the male part (6 or 6A) and the female part (7 or 7A) is provided an annular passage (22 or 22A) for the heating oxygen/gas mixture; and

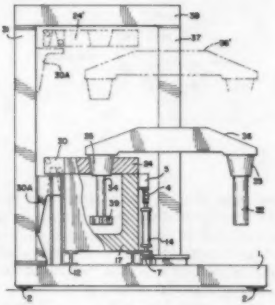
(c) in communication with the holes (21 or 21A) are either hollows (21*a*) provided in the lower protruding portion of the flange (20) or assemblies (24, 25) provided in the female part (7A), with said hollows (21*a*) or assemblies (24, 25) communicating with the annular passage (22 or 22A).

4,443,004

DEVICE FOR THE TREATMENT OF A STREAM OF ALUMINUM OR MAGNESIUM-BASED LIQUID METAL OR ALLOY DURING ITS PASSAGE

Jean-Marie Hicter, Voiron; Thierry Le Scoul, Voreppe, and Serge Mairet, Monestier de Clermont, all of France, assignors to Societe de Vente de l'Aluminium Pechiney, France

Filed Sep. 28, 1982, Ser. No. 425,448
Claims priority, application France, Oct. 14, 1981, 81 19710
Int. Cl.³ F27B *14/02*
U.S. Cl. 266—226 12 Claims



1. A device for the treatment of a stream of aluminum or magnesium-based liquid metal or alloy during its passage, comprising a ladle comprising an external metal casing, an internal refractory lining, a channel for the admission of the crude liquid metal at the rear, a nozzle for casting the treated liquid metal at the front and at least one internal partition leaving, with the bottom of the ladle, a space for the circulation of the liquid metal and subdividing the ladle into a first rear compartment and at least one front compartment opening at the casting nozzle; a cradle on which the ladle is fixed; an articulated frame relative to which the said cradle can rock forwards about a first horizontal axis passing through the casting nozzle; and a a platform, the articulated frame being connected to the platform relative to which the articulated frame can rock about a second horizontal axis.

4,443,005

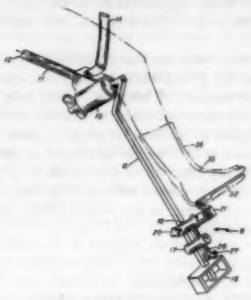
FOOT SUPPORT DEVICE

Edward D. Sugarman, 6726 Gleason Pl., Fayetteville, N.Y. 13066, and Alan W. Brownlie, Skaneateles, N.Y., assignors to Edward D. Sugarman, Fayetteville, N.Y.

Filed Sep. 9, 1982, Ser. No. 416,098
Int. Cl.³ A61G *13/00*
U.S. Cl. 269—328 9 Claims

1. In a limb positioning device adapted for use with an operating table, the device including a central support member, means for detachably securing the support member to the operating table, and an extension member movably connected to the support member, the improvement comprising a foot holding unit having coacting first and second post members slidably mounted on the extension member, means interconnecting the post members whereby they can be moved in unison along the extension member, locking means on the first post member for securing it in a desired position of longitudinal adjustment on the extension member, a foot engaging plate mounted on the second post member so as to be angularly adjustable with respect thereto, and locking means on the second post member for securing the foot engaging plate in a

desired position of angular adjustment, the post interconnecting means permitting fine adjustment of the longitudinal posi-



tion of the second post member on the extension member relative to the position of the first post member.

4,443,006

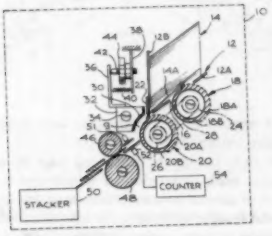
DOCUMENT AND CURRENCY COUNTER

Kaiichi Hasegawa, Kawasaki, Japan, assignor to Billcon Corporation of America, Compton, Calif.

Continuation-in-part of Ser. No. 170,646, Jul. 21, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,188

Int. Cl.³ B65H *3/06*

U.S. Cl. 271—10 **8 Claims**



1. A sheet counter or the like including:

means for holding a stack of sheets of dimension "1" in the direction of feeding thereof through said counter;

a feed-in roller rotatably supported for contacting the bottom sheet in said stack of sheets to feed such sheet from said stack;

a delivery roller rotatably supported in spaced relationship with respect to said feed-in roller for receiving each sheet fed from said stack;

a guide member supported in juxtaposed but spaced alignment with said delivery roller for guiding each sheet around the cylindrical surface of said delivery roller, said guide member having an output edge;

tension rollers having a contact line therebetween and being positioned by a dimension less than "1" from said guide member with their axes parallel to the axis of said delivery roller for receiving and feeding forward at relatively high speed each sheet emerging from the space between said guide member and said delivery roller;

said delivery roller having a surface with a first portion having a high coefficient of friction and a second portion of a low coefficient of friction;

said feed-in roller also including a first portion having a high coefficient of friction and a second portion having a low coefficient of friction;

said delivery roller having a flange movable in concert therewith, said flange having a radius substantially equal to the radius of said first portion and having a length equal to that of said second portion of said delivery roller and being positioned contiguous therewith.

4,443,007

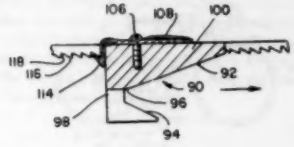
INSERTER WITH IMPROVED RAM MECHANISM

William Adamoski, Stamford, and Alan B. Hotchkiss, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Division of Ser. No. 185,856, Sep. 11, 1980, Pat. No. 4,379,383. This application Jan. 7, 1983, Ser. No. 456,469

Int. Cl.³ B65H *5/16;* **B65B** *5/04*

U.S. Cl. 271—269 **5 Claims**



1. A ram mechanism for an envelope inserter adapted to transport enclosures from an enclosure pick-up station to an envelope positioned at an envelope station, the ram mechanism comprising a ram block, a ram blade, means securing the ram blade to the ram block, pusher means for engaging the trailing edge of an enclosure seated at the pick-up station and advancing the enclosure into the envelope, the pusher means extending downwardly from the underside of the ram blade and means adjustably securing the pusher means to the ram blade, the securing means comprising spring biasing means positioned on the upper surface of the ram blade, means securing the pusher means to the spring biasing means, the spring biasing means including means extending to the underside of the ram blade, the extending means being upwardly spring biased, means for forming a transverse grating on the underside of the ram blade, the extending means being in interlocking engagement against the grating, the extending means being operator engageable on the upper surface of the ram blade to release the spring biased engagement between the extending means and the grating whereby the position of the pusher means relative to the ram blade may be adjusted to compensate for varying width of enclosures.

4,443,008

RUNNING TYPE HEALTH PROMOTING DEVICE

Keizo Shimano, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 7, 1980, Ser. No. 204,912

Claims priority, application Japan, Nov. 22, 1979, 54-151639

Int. Cl.³ A63B *21/00, 23/04*

U.S. Cl. 272—73 **9 Claims**

1. A running type health promoting device comprising:

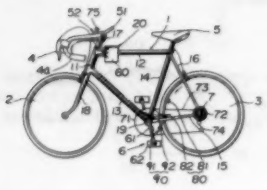
(a) a running vehicle comprising a frame, at least one front wheel and at least one rear wheel which are supported to said frame, a handle bar, a saddle, a pedalling device, and a transmitting device for transmitting the pedalling operation of said pedalling device to said rear wheel,

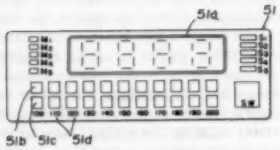
(b) a microprocessing unit supported to said frame of the vehicle and having a processing circuit which sets a period of time for training and a proper number of pulses of a driver during the period of time for training corresponding to a proper quantity of bodily exercise, said microprocessing unit setting said period of time and proper number of pulses in response to an input means which provides personal information concerning said driver, and target information concerning a desired type of training which are input thereto,

(c) a pulse detector which is electrically connected with an

input of said microprocessing unit, for detecting the pulse of a driver who drives said vehicle, and feeds a detection signal of the detected driver pulse into said microprocessing unit, said microprocessing unit comparing a detected driver pulse with said proper number of pulses and setting a proper number of revolutions of the pedals required to achieve said proper quantity of bodily exercise during said time period,

(d) a measuring instrument electrically connected with the input of said microprocessing unit so as to measure the training time period and feed a timing signal therefor into said microprocessing unit, said microprocessing providing





an output when said set training period of time has elapsed,

(e) an indicator electrically connected with the output of said microprocessing unit so as to indicate said proper number of revolutions of said pedals for matching the proper number of pulses set by said microprocessing unit and also indicating completion of said training when the driver completes training under the set number of pulses during the set time period, and

(f) a source of electric energy electrically connected to operate said microprocessing unit, pulse detector, measuring instrument and indicator at least while said vehicle is being driven.

4,443,009

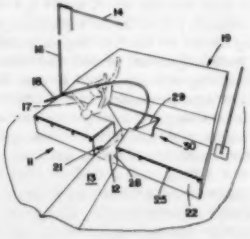
POLE VAULTER'S LANDING CUSHION

Stephen N. Smith, Leucadia, Calif., assignor to Ampro Corporation, Anaheim, Calif.

Filed Oct. 5, 1981, Ser. No. 308,594

Int. Cl.³ A63B *5/00*

U.S. Cl. 272—104 **12 Claims**



1. In a pole vaulter's landing cushion having a front end with a rearwardly extending notch therein for receiving the base of a vaulting pole, the notch having spaced apart sidewalls defining a pole planting region at the back end of the notch and defining a more forward region between the pole planting region and the front end of the cushion, the improvement comprising:

a notch configuration wherein the top of said notch is sufficiently broad at said pole planting region to accommodate a predetermined amount of bending of said pole towards the sides of said notch while being sufficiently narrower at said forward region to inhibit said predetermined amount of bending of said pole towards said sides of said notch, said sidewalls being stepped at the location where said pole planting region connects with said forward region to provide an abrupt change in the width of the top of said notch at said location.

4,443,010

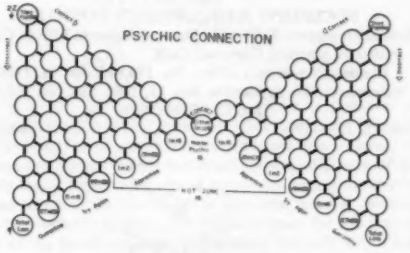
PSYCHIC CONNECTION GAME

Laurie G. Larwood, 9812 Lindero Ave., Montclair, Calif. 91763

Filed Jan. 18, 1982, Ser. No. 340,063

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—242 **6 Claims**



1. A game apparatus for evaluation and development of psychic abilities, comprising:

a set of objects having at least one pair of multi-valued dimensions, each dimension of which can separately be the object of mental concentration in an attempt to formulate mental images necessary for telepathy, clairvoyance, precognition or psychokinetic phenomena;

a gameboard containing at least two sets of player positions, each set arranged such that net movement is in a particular direction if said mental images are correctly perceived by one or more players and having some positions contain a probability marking denoting the odds of arriving at a given position after a given number of rounds when influenced by random chance alone; and

a set of player game pieces to be assigned to individual players to note their relative progress on said gameboard, said game pieces being moved in said particular direction whenever an image transmitted by another is correctly perceived, or whenever a pre-existing value is correctly perceived, or whenever a future value is correctly foreseen, or whenever a future value is correctly influenced by said thought concentration.

4,443,011

METHOD OF PLAYING CHESS FOOTBALL

Raymond J. Sheridan, 119 St. Marks Pl., Roslyn Heights, N.Y. 11577

Division of Ser. No. 290,060, Aug. 4, 1981, abandoned. This application Aug. 4, 1983, Ser. No. 519,899

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—247 **1 Claim**

1. The process of playing a game device capable of simulating in all of its aspects in game form upon a game board marked off to simulate a football field and divided into squares so as to

designate numerous specific locations on said game board, the game of football, wherein a first player and a second player, each with their own player pieces which are positioned upon said game board in opposing alignments comparable to the various alignments that occur during an actual football game, seek to score points against each other as done in the game of football by the rolling of dice, said process comprising:

(a) the rolling by said first player of a first die so as to determine in a random fashion the movement of said first player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said first die, said movement of said player pieces being compatible with said first player offensively moving his player pieces in accordance with the game of football,

(b) the then rolling by said second player of one die so as to determine in a random fashion the movement of said second player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said first die said movement of said player pieces being compatible with said second player defensively moving his player pieces in response to the movement of the player pieces of said first player and in accordance with the game of football;

(c) the then rolling by said first player of two dice so as to determine in a random fashion the movement of said first player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said two dice, said movement of said player pieces being compatible with said first player offensively moving his player pieces in accordance with the game of football;

(d) the then rolling by said second player of two dice so as to determine in a random fashion the movement of said second player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said two dice said movement of said player pieces being compatible with said second player defensively moving his player pieces in response to the movement of the player pieces of said first player and in accordance with the game of football;

(e) the then rolling by said first player of three dice so as to determine in a random fashion the movement of said first player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said three dice, said movement of said player pieces being compatible with said first player offensively moving his player pieces in accordance with the game of football;

(f) the then rolling by said second player three dice so as to determine in a random fashion the movement of said second player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said three dice said movement of said player pieces being compatible with said second player defensively moving his player pieces in response to the movement of the player pieces of said first player and in accordance with the game of football;

(g) the then rolling by said first player of four dice so as to determine in a random fashion the movement of said first player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said four dice, said movement of said player pieces being compatible with said first player offensively moving his player pieces in accordance with the game of football;

(h) the then rolling by said second player of four dice so as to determine in a random fashion the movement of said second player's individual player pieces upon said game board any number of squares upon said game board up to the number appearing on the roll of said four dice said movement of said player pieces being compatible with said second player defensively moving his player pieces in response to the movement of the player pieces of said first player and in accordance with the game of football;

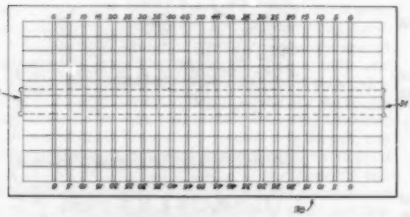
(i) continuing said rolls until a defensive player piece either crosses a square on said game board simultaneously with the offensive player piece designated to be carrying the ball or the player designated to be carrying the ball has crossed his opponent's goal line.

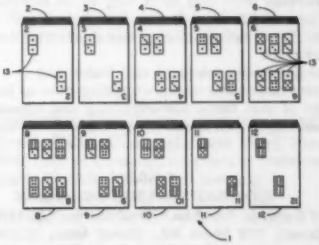
4,443,012

COMBINATION CARD AND DICE GAME

Edward M. Makovic, and Dorothy I. Makovic, both of 510 N. Lincoln, Coal City, Ill. 60416

Filed Mar. 2, 1981, Ser. No. 239,842
Int. Cl.³ A63F 1/04
U.S. Cl. 273—292 **4 Claims**

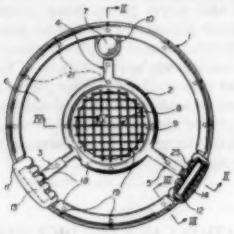




1. A method of utilizing a game apparatus, including selection of a deck of cards having a plurality of cards of different suits, selection of a random selection means having identifying means corresponding to said different suits of said deck of playing cards, dealing said cards to a plurality of players, a first one of said players operating said random selection means to randomly identify one of said suits, removing a card in such identified suit in such first player's hand from further play, repeating operation of said random selection means by said first player and removing from his hand cards in suits identified by each such operation of said random selection means until said random selection means identifies a suit for which said first player does not have a card, passing the play to the nearest adjacent player who has a card in the suit identified by said random selection means as a result of its last operation, said nearest adjacent player removing such card from further play, said nearest adjacent player then operating said random selection means repeatedly and removing cards from his hand in suits identified by each such operation of said random selection means, wherein the step of selecting a deck of cards having a plurality of cards of different suits includes the step of selecting a deck wherein the plurality of different suits correspond respectively to the numbers two, three, four, five, six, eight, nine, ten, eleven and twelve, wherein the step of selecting a random selection means includes the step of selecting a pair of game dice operable to roll the number combinations two, three, four, five, six, seven, eight, nine, ten, eleven and twelve, and including the additional step of passing the play to the next

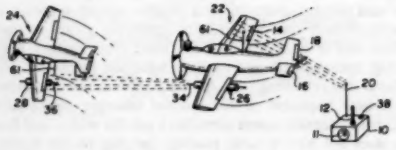
adjacent player when said nearest adjacent player rolls said pair of dice and produces the number combination of seven.

4,443,013
HAND RACKET FOR BALL GAME WITH SIGNAL-GENERATING MEANS
Johanna Burt, 2 Hillside Crescent, New Rochelle, N.Y. 10804
Filed Jul. 23, 1982, Ser. No. 401,260
Int. Cl.³ A63F 9/00
U.S. Cl. 273—318 **6 Claims**



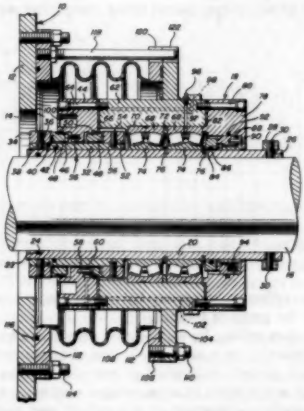
1. In a game of skill, the combination of a ball with a hand racket for bouncing said ball, said racket comprising:
a circular pad having a diameter exceeding that of said ball;
a frame concentrically surrounding said pad, said frame including an inner ring encircling said pad, an outer ring separated from said inner ring by an annular clearance whose width exceeds the diameter of said ball, and a plurality of radial spokes in said clearance interconnecting said rings;
signal-generating means on said frame; and
pressure-responsive means extending over at least a major part of said frame for triggering said signal-generating means upon said frame being struck by the ball.

4,443,014
COMBAT SIMULATOR MEANS
Bernard Kovit, 41 Wood La., Woodsburgh, N.Y. 11598; Richard G. Koenig, 258 Shore Rd., Mount Sinai, N.Y. 11766, and Robert W. Kress, 27 Mill Rd., Lloyd Harbor, N.Y. 11743
Filed Jul. 27, 1981, Ser. No. 287,365
Int. Cl.³ F41J 9/08; A63H 27/02, 30/04
U.S. Cl. 273—363 **9 Claims**



1. A simulator of combat engagement of a first means, said simulator including:
a remote control means;
a first receiver within the first means for the receiving signals of the remote control means for control of the first means, said first receiver also having a "fire" controlling and "kill" indicating output signals;
a connector having one portion thereof on said first means;
a detachable means for the first means having the other portion of the connector, a second receiver, a pulse width modulator, a transmitter and a hit counter in a circuit connected with the one portion upon assembly of detachable means to the first means to permit signals from the output signals of said first receiver to place said detachable means under command of said remote control means, said detachable means having mode control means to control operation of said first means either as a commanded passive target means to indicate combat effectiveness or as a firing means.

4,443,015
CARTRIDGE TYPE ROTARY SHAFT SEAL WITH BEARINGS AND BELLOWS
Henry S. Duffee, and Meigs C. Golden, Jr., both of Florence, S.C., assignors to Five Star Seal Corporation, Florence, S.C.
Filed Jul. 14, 1982, Ser. No. 398,182
Int. Cl.³ F16J 15/34, 15/54
U.S. Cl. 277—30 **9 Claims**



1. In combination with a housing wall having an opening therein through which a rotary shaft projects, a cartridge-type seal assembly, said seal assembly including one-piece inner bearing race supporting sleeve means axially removably slidable on, sealed relative to and releasably anchored in axial position on said shaft, a floating annular outer bearing race supporting housing disposed about said sleeve means, bearing means including inner and outer races removably stationarily supported from said sleeve means and housing, respectively, against axial and angular displacement relative thereto, said sleeve means including first rotary aixal face seal ring means removably stationarily supported therefrom in sealed engagement therewith and said housing including second stationary axial face seal ring means removably stationarily supported therefrom and with which said first rotary axial face seal ring means is rotatably slidably engaged, a cylindrical fluid imperious bellows assembly including opposite axial end annular end portions, first means removably securing one of said end portions to said wall in sealed engagement therewith about said opening and second means removably securing the other end portion to said annular housing in sealed engagement therewith.

4,443,016

CLAMP RING DEVICE FOR THE SECURING AND REMOVAL OF A COVER OVER A PRESSURE VESSEL

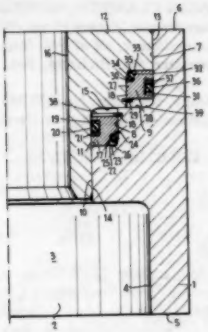
Peter Schüngel, Bork, Fed. Rep. of Germany, assignor to Klöckner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany

Filed Jul. 21, 1983, Ser. No. 515,597

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 8230533[U]

Int. Cl.³ F61J 15/06; B65D 53/00

U.S. Cl. 277—73 3 Claims



1. A clamp ring device for a plurality of bolt-clamp members to facilitate the securing and removal of a cover over a pressure vessel, comprising an annular clamp ring consisting essentially of aluminum and having a plurality of evenly spaced coaxial through bores for the reception of cover bolts and associated cover nuts, each said bore being defined by a cylindrical surface of a predetermined first diameter for the reception of one of the cover nuts, said surface extending from one side of said ring partially toward the opposite side thereof, and the remainder of said each bore being defined by a stepped cylindrical surface of a second diameter at said opposite end followed by a third diameter less than said second diameter and followed by a fourth diameter less than said third and first diameters, a circular ring piston received within said each bore at said stepped surface thereof for axial movement, said piston having outer cylindrical surfaces respectively in engagement with said second and fourth diameter surfaces, high-pressure annular seal means disposed between said third cylindrical surface and said piston, said second and fourth diameter surfaces and the inner periphery of said seal means defining a stepped cylindrical bore for said piston, and said seal means comprising an annular support ring, an elastomeric static seal ring, and an elastomeric dynamic seal ring.

4,443,017

ANNULAR SEAL

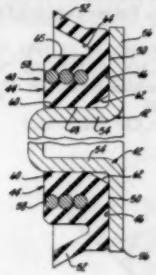
Henry J. Knott, Detroit, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Sep. 29, 1982, Ser. No. 426,394

Int. Cl.³ F16J 15/32

U.S. Cl. 277—152 5 Claims

1. An annular seal for a piston comprising an annular elastomeric seal body and a sealing lip extending radially from said body, said seal body including an axially extending mounting surface which is adapted to engage a support surface on said piston in interfering relationship and characterized by an annular retaining member located within said seal body and completely radially enclosed therewithin comprising a continuous, spirally wound, elastic, steel spring wire including multiple adjacent loops wherein said loops are generally aligned with said mounting surface and spaced apart therefrom to force said mounting surface against said support surface, said springwire being round in cross-section and said coil being normally closed whereby adjacent loops of said coil are in substantially point to point contact, said wire loops being mechanically



bonded together by said elastomeric material being molded substantially entirely about said wire loops and into spaces formed between adjacent wire loops.

4,443,018

GASKET FRAME MADE OF ELASTOMER MATERIAL

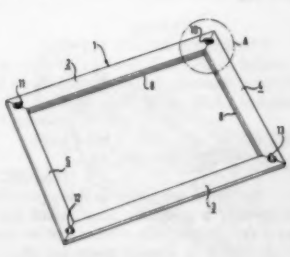
Gerd W. Samol, Heimenkirch, and Horst Pittel, Burgwedel, both of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,004

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1982, 3200652

Int. Cl.³ F16J 15/02; B29H 7/00

U.S. Cl. 277—189 6 Claims



1. Gasket frame made of elastomeric material with straight gasket profile portions and closed angular corners, wherein at each corner of the gasket frame a first leg of a metallic angle extends through a miter-cut end into the end region of a first straight gasket profile portion forming a corner, said first gasket profile portion having a hollow space extending in the longitudinal direction of the gasket portion to accommodate the first leg of the metallic angle, and a second leg of said metallic angle similarly extends through a miter-cut end of a second profile portion forming said corner, and wherein said legs are adhesively connected with the corresponding end regions of the gasket profile portions.

4,443,019

AQUEOUSLY-SWELLING WATER STOPPER AND A PROCESS OF STOPPING WATER THEREBY

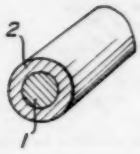
Yoshinobu Ishido, and Hideo Tanaka, both of Fukuyama, Japan, assignors to Hayakawa Rubber Company Limited, Fukuyama, Japan

Division of Ser. No. 226,896, Jan. 21, 1981, Pat. No. 4,366,284. This application Apr. 19, 1982, Ser. No. 369,625

Claims priority, application Japan, Oct. 17, 1980, 55-145358; Oct. 17, 1980, 55-145359

Int. Cl.³ E02D *29/16*

U.S. Cl. 277—227 10 Claims



1. A water stopper comprising an elongated core member having a high tensile strength, and at least one layer of an aqueously-swelling water-stopping composition secured to the outer surface of said elongated core member; wherein said aqueously-swelling water-stopping composition consists of 10 to 40 weight % of rubber whose main ingredient is reclaimed rubber blended with less than 30 weight % of virgin rubber, 10 to 20 weight % of a silicic compound selected from the group consisting of silicic acid anhydride, hydrous silicic acid and calcium silicate, 10 to 60 weight % of bentonite, and 10 to 40 weight % of plasticizer.

4,443,020

MECHANICAL GRIPPING DEVICE FOR ROTATING JAW CHUCKS OR COLLET CHUCKS

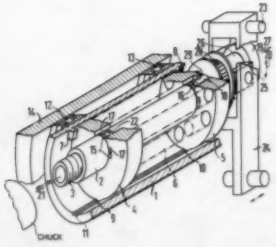
Dieter Krause, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 23, 1981, Ser. No. 304,798

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1980, 3038208

Int. Cl.³ B23B *31/24, 31/26*

U.S. Cl. 279—1 DA 5 Claims



1. A mechanical chuck activating system for rotating chucks, comprising: a chuck; means for activating the chuck for gripping of a part to be rotated from the outside or from the inside by either pulling or pressing a member to which the chuck is coupled, said means including pressure springs and two spring plates arranged in a bore hole of a spindle, the springs being arranged such that they are prestressable by means of axial displacement of a pulling or pressing slide means coupled to the chuck to operate it; axially spaced stop means in said spindle bore defining spaced end stop positions, each of said spring plates being axially displaceable up to a respective one of said end stop positions, each of the plates being pressed to the respective one of said end stop positions by said pressure springs arranged between the plates; said pulling or pressing slide means being positioned through the spring plates for activating the chuck; and coupling means selectively coupling said slide means with one of the two spring plates while the other spring plate is uncoupled and vice-versa so as to selectively provide either a pulling or pressing force via the slide means to the chuck.

4,443,021

APPARATUS FOR ADJUSTING TWO END POSITIONS LIMITING A CLAMPING STROKE

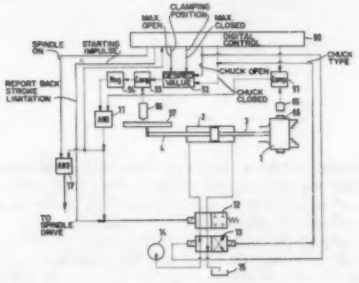
Albert Buchholz, Langenhagen; Werner Hesse, Wedemark, and Günther Möller, Langenhagen, all of Fed. Rep. of Germany, assignors to Gildemeister AG, Bielefeld, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,305

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3004988

Int. Cl.³ B23B *31/16, 31/30*

U.S. Cl. 279—4 3 Claims



1. Apparatus for adjusting two end positions limiting a clamping stroke of the power-actuated chuck jaws of an exchangeable workpiece-clamping unit of a machine tool and for determining the attainment of the end positions, comprising:

position-indicating means for indicating the actual position of the clamping position of said jaws and adjusted along with each adjustment of the clamping jaws,

desired-value transmitting means for transmitting signals corresponding to said two end positions,

comparator means for receiving signals corresponding to the position indicated by said position indicating means and the signals from said transmitting means and for generating a locking signal for said machine tool when conformity between one of the end positions and said actual position has been established,

a code transmitter on said workpiece-clamping unit,

a code reader for reading signals from the code transmitter,

programming control means for emitting a set-point signal for the machine tool, and

second comparator means for comparing the code read by the reader with the set-point signal and for generating a locking signal for the machine tool if there is a discrepancy between the two.

4,443,022

ROLLER SKATE

Gordon K. Ware, Chicago, Ill., assignor to The Chicago Roller Skate Company, Chicago, Ill.

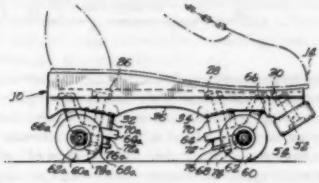
Filed Sep. 21, 1981, Ser. No. 303,902

Int. Cl.³ A63C *17/02*

U.S. Cl. 280—11.28 8 Claims

1. A roller skate comprising a unitary sole plate having toe and heel portions joined by an instep portion, a top surface for receiving a shoe and a bottom surface for receiving truck

assemblies; a front wheel truck assembly at the toe portion of the sole plate bottom surface and a rear wheel truck assembly at the heel portion of the sole plate bottom surface, each truck assembly including a cushioned action screw connected to the sole plate and extending through a platform from which a strut arm inclines upwardly toward the adjacent end of the sole plate; said sole plate bottom surface having a pair of downwardly open recesses, one adjacent the front of the toe portion and the other adjacent the rear of the heel portion, with each recess having an upper closed end and a lower end opening defined by downwardly relatively diverging internal wall surfaces of the recess which are substantially free of any undercutting relative to the upper closed end and with a portion of the internal wall surface of each recess toward the adjacent end of the sole plate extending downwardly below the remaining diverging internal wall surface and in continued divergence relative thereto and more remotely spaced from the associated strut arm; and a cushion element mounted in each recess and conforming to the shaping of the internal wall surfaces thereof and having a socket therein similarly inclined with respect to the associated strut arm and of complementary shape for receiving the free end of the associated strut arm; and with the socket opening disposed vertically above the terminal end of the downwardly extending internal wall surface of the recess leaving therebetween additional thickness of the cushion material which is inclined downwardly from the socket opening and away from confining engagement with the associated strut for permissive expansion and recovery of the inclined and unconfined cushion material under active movements of the strut arm.

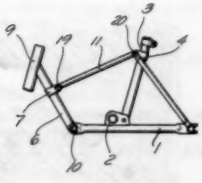


4,443,023

METHOD AND DEVICE FOR DISPLACING THE HEAD TUBE OF A BICYCLE

Hideyuki Ishibashi, Ageo, Japan, assignor to Bridgestone Cycle Co., Ltd., Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,042
Int. Cl.³ B62K *19/32*
U.S. Cl. 280—278 **6 Claims**



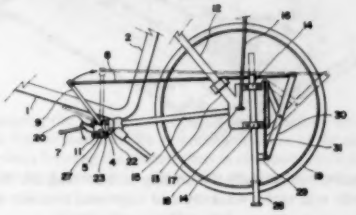
1. In a bicycle frame comprising a chain stay means, a seat tube extending from said chain stay means, an inclined down tube pivotally connected to said chain stay means and forward of said seat tube, a top longitudinally extending element connected between said seat tube and said down tube, head pipe means mounted on said down tube, a first eccentric means connecting said top element to said seat tube and a second eccentric means connecting said top element to said down tube to thereby provide for adjusting the pivotal position of said down tube and thereby the relative position of said head pipe means relative to said seat tube.

4,443,024

BICYCLE STAND UNIT

Tamao Okai, 143, Nabura, Ka'aicho, Kitakatsuragigun, Nara, Japan

Filed Jan. 25, 1982, Ser. No. 342,199
Int. Cl.³ B62H *1/06*
U.S. Cl. 280—304 **1 Claim**



1. A bicycle stand unit for a bicycle having a rear tire with a hub comprising a pair of attachments made of a metal plate provided at the hub of the rear tire, a leg mounted on each said attachment, each of said legs being slidable up and down along said attachment, a pair of toggle joints each of which is pivotally connected at its lower end to one said leg, a pair of heavy duty-springs each of which is provided between a lower end of said toggle joint and an upper section of said attachment, said heavy-duty spring being adapted to urge said leg upwards, a pair of swingable arms each of which is connected to an opposite end of one said toggle joint by means of a rod whereby the movement of said arm is transmitted to said toggle joint, said pair of swingable arms being carried on a rotary shaft, a foot lever rigidly connected to said rotary shaft, said foot lever being operable by foot, said rotary shaft being rotatively supported on a pair of brackets affixed to the down tube of the bicycle, said foot lever having a stop pin adapted to engage in a notch produced in a rocker pivotally affixed to one of said brackets, a lockpin inserted through said bracket, said lockpin being adapted to lock said rocker to prevent its rocking movement.

4,443,025

FIFTH WHEEL ASSEMBLY

Samuel A. Martin, Holland; Fredrick J. Bakker, West Olive; Gerald W. Hungerink; Jack L. Gisinger, both of Holland, and James H. Bush, Zeeland, all of Mich., assignors to Holland Hitch Company, Holland, Mich.

Filed Mar. 3, 1982, Ser. No. 354,240
Int. Cl.³ B62D *53/08*
U.S. Cl. 280—407 **26 Claims**

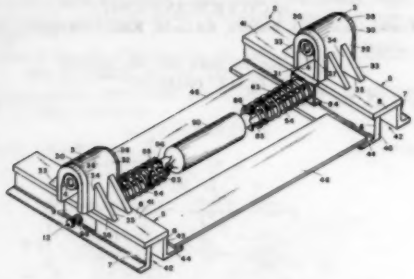
1. In a fifth wheel coupling for selectively interconnecting tractor and trailer units, including a base plate adapted for connection with a tractor unit, and having a pair of slotted, parallel racks mounted thereon in a laterally spaced apart relationship, and a trunnioned fifth wheel assembly adapted for selective connection with a trailer unit, an improved trunnion bracket to pivotally mount said fifth wheel assembly on said base plate, comprising:

a pair of channels having a generally rectangular side elevational shape, and an uncomplicated construction with substantially flat upper surfaces, and open bottoms which form guides that are received over and mate with said racks for sliding movement along said racks;

a pair of forged, high-strength bearing caps, having a generally inverted U-shape, and being fixedly anchored to the flat upper surfaces of said rectangular channels in a sub-

stantially perpendicular relationship with said rectangular channels;

a pair of separate bearing sleeves positioned within said bearing caps, and being fixedly anchored therein; and



means for selectively connecting said rectangular channels with said racks, whereby said improved trunnion bracket is strong, and can be readily manufactured.

4,443,026

GAS SUSPENSION SYSTEMS FOR VEHICLES

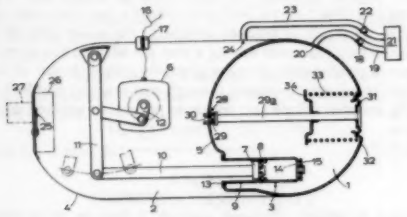
Anthony W. Harrison, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 29, 1981, Ser. No. 335,445

Claims priority, application United Kingdom, Jan. 10, 1981, 8100737

Int. Cl.³ B60G *11/28*

U.S. Cl. 280—714 **19 Claims**



1. a suspension system for levelling a vehicle comprising a suspension unit in which is contained a volume of air under pressure to define a gas spring for supporting the load on a wheel or axle, a high pressure reservoir having an outlet, a low pressure reservoir having an inlet, first connection means for connecting said outlet of said high pressure reservoir to said suspension unit, second connection means for connecting said suspension unit to said inlet of said low pressure reservoir, a first control valve disposed in said first connection means for controlling the flow of air from said high pressure reservoir to said suspension unit, a second control valve disposed in said second connection means for controlling the flow of air from said suspension unit to said low pressure reservoir, a pump for maintaining a pressure difference between said high pressure reservoir and said low pressure reservoir, a vacuum relief valve provided in said low pressure reservoir to allow communication between the atmosphere and said low pressure reservoir, and a spring-loaded dump valve which is provided to allow communication between said high pressure reservoir and said low pressure reservoir.

4,443,027

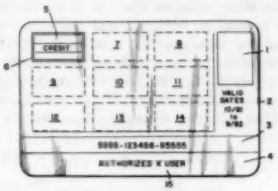
MULTIPLE COMPANY CREDIT CARD SYSTEM

Maurice G. McNeely, 250 Ohua Ave., Apt. 8C, Honolulu, Hi. 96815, and Rodney A. Gomes, 1760 Hookupa St., Pearl City, Hi. 96782

Filed Jul. 29, 1981, Ser. No. 287,980

Int. Cl.³ B42D *15/00*

U.S. Cl. 283—83 **5 Claims**



1. A multiple-company credit card system comprising

(a) a primary identification plate containing legible means for identifying an authorized user, and coded means for identifying said user, plural solid, slightly recessed spaces on a front of the primary plate for affixation of a plurality of miniature credit indicators, and plural primary plate microcircuit chip coding means embedded in the primary plate adjacent the recessed spaces, the primary plate chip coding means having interconnection means extending into the recessed spaces for connecting with credit indicators mounted in the recessed spaces, and

(b) at least one miniature credit indicator having an upper side comprising a miniature reproduction of a credit card issued to an authorized user by a credit-granting establishment, each indicator having an underside with an adhesive means for attaching the indicator to one of the slightly recessed spaces in the primary plate, and a microcircuit chip embedded in each miniature credit indicator, the credit indicator microcircuit chips being adapted to interconnect with microcircuit chips embedded in the primary plate, each of the miniature indicators being provided with a microcircuit chip which is different from a microcircuit chip in any other miniature indicator.

4,443,028

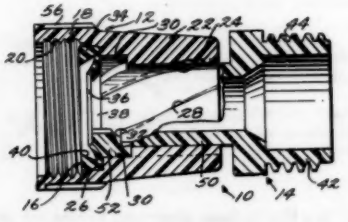
QUICK COUPLING ASSEMBLY

Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corporation, Inc., Peoria, Ill.

Filed Aug. 14, 1981, Ser. No. 292,430

Int. Cl.³ F16L *37/24*

U.S. Cl. 285—38 **13 Claims**



1. A quick coupling assembly for connecting and disconnecting a threaded male hose fitting with a cooperating threaded female fitting with a quick turning action rather than the greater turning action required to connect and disconnect the threaded male and female fittings directly comprising:

a tubular female coupling member having a male fitting engaging end portion formed with interior threads on the

interior periphery thereof for cooperatively threadedly engaging a threaded male hose fitting,

the axial extent of said male fitting engaging end portion being approximately 50% of the pitch diameter of said interior threads,

the remaining portion of said female coupling member constituting a female coupling portion having an axial extent within the range of 75% to 125% of said pitch diameter,

said female coupling portion having a generally cylindrical interior periphery of a diameter size less than said pitch diameter defining at a position adjacent the inner end of said interior threads an annular shoulder facing in a direction toward said interior threads,

the interior periphery of said female coupling portion having formed therein a plurality of annularly spaced grooves extending from the outer end thereof through said annular shoulder and a corresponding plurality of correspondingly annularly spaced notches extending from said annular shoulder toward said outer end,

the radial extent of said grooves and notches being less than the radial extent of said shoulder so that the latter includes an uninterrupted outer annular sealing surface,

an annular resilient seal having an outer annular portion sealingly engaging the uninterrupted outer sealing surface of said shoulder and an inner annular portion extending over the notches and grooves formed in said shoulder, and

a tubular male coupling member having a female fitting engaging end portion formed with exterior threads on the exterior periphery thereof and exterior gripping surfaces on the exterior periphery thereof adjacent the inner end of said exterior threads,

said exterior threads having a pitch diameter generally the same as the aforesaid pitch diameter;

the axial extent of said female fitting engaging end portion being within the range of from 65% to 85% of said pitch diameter,

the remaining portion of said male coupling member constituting a male coupling portion having an axial extent slightly larger than the axial extent of said corresponding female coupling portion,

said male coupling portion having a plurality of annular spaced lugs on the exterior periphery thereof adjacent the outer end thereof of a size to engage within said grooves and said notches and an outwardly facing annular sealing surface on the outer extremity thereof operable when said lugs are engaged inwardly beyond said grooves and engaged within said notches to sealingly engage the inner annular portion of said resilient seal and to resiliently deflect the same in a direction away from said shoulder whereby said resilient seal serves to resiliently bias said lugs into engagement within said notches and hence said coupling members in interlocked relation and to provide an interior seal for both of said coupling members when in said interlocked relation.

4,443,029

TUBULAR CLAMP ASSEMBLY

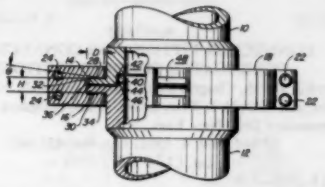
Darryl E. Laxo, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 8, 1982, Ser. No. 347,114
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—93 **5 Claims**

1. A coupling unit for joining two pipe ends, which comprises: flanges extending radially outward from each end, the outer flange surfaces inclining towards the flange faces in the direction of the pipe axis;

at least a pair of semicircular clamp members, each member having a recess therein defined by a base portion and radially extending surfaces for receiving the pipe flanges, the radially extending surfaces of said clamp members forming said recesses being inclined to converge inwardly toward the pipe axis, and said surfaces having a minimum separation approximately equal to the maximum combined thickness of the abutting flanges;

said clamp members having wedge element means associated with the clamp members at the base of the recess inclining coacting with said outer flange surfaces for



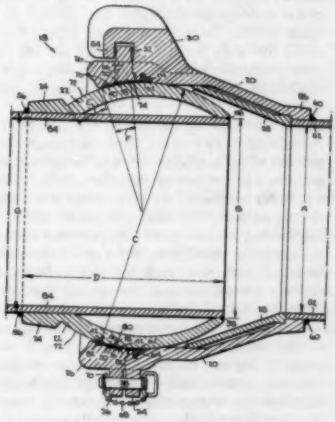
separating the flanges into direct complementary contact with the inclined radially extending surfaces of the clamp members forming the recess when in clamped position and means for holding said clamp members in clamped position.

4,443,030

BALL JOINT

Hannon S. Hairston, Daphne, and M. E. Hanrath, Mobile, both of Ala., assignors to Mobile Pulley & Machine Works (A division of Lehigh Valley Industries, Inc.), Mobile, Ala.

Filed Nov. 4, 1981, Ser. No. 318,145
Int. Cl.³ F16L *27/04, 55/00*
U.S. Cl. 285—263 **6 Claims**



1. A ball joint particularly useful in dredging operations and attached to pipe floating at or near the surface of water, said ball joint comprising:

(a) a case attached to the end of a first pipe;

(b) a ball attached to the end of a second pipe;

(c) a gland rotatably securing at least part of the ball within the case, said gland having a first wider circumferential groove on its inner surface with at least one narrower circumferential groove in the first wider groove; and

(d) an elastic, resilient gland liner having a first surface that circumferentially slidably engages the first groove of the gland and a second surface that slidably engages the outer surface of the ball, said first surface having at least one stiffening circumferential convex rib that slidably and matingly engages the at least one narrower circumferential groove in the gland;

wherein (e) the gland liner is free to travel circumferentially within the grooves with respect to both the gland and the

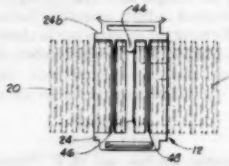
ball; (f) the ball joint floats above or near the surface of the water and the ball and case are free to swivel and to rotate axially with respect to one another in response to wave action; and (g) the liner is able to be quickly removed from the gland and replaced without detaching the case or ball from the first or second pipe, respectively.

4,443,031

CONNECTOR FITTING FOR CONNECTING CORRUGATED CONDUIT SECTIONS

Richard J. Borsh, Chagrin Falls, Ohio; Steven W. Neff, Clinton, Iowa, and Harold T. Pate, Solon, Ohio, assignors to Thyssen-Bornemisza Inc., New York, N.Y.

Filed Nov. 4, 1982, Ser. No. 439,045
Int. Cl.³ F16L *21/06*
U.S. Cl. 285—419 **3 Claims**



1. A connector fitting for interconnecting a pair of flexible corrugated conduit sections comprising:

a pair of complementary arcuate sections each including:

a semi-cylindrical body portion having arcuate, semi-cylindrical corrugation-engaging ribs carried on the concave inner surface thereof and spaced axially from each other along the body portion, said body portion further having axially opposite ends and opposed side edges lying in, and defined by, a diametric plane of said semi-cylindrical body portion;

a female receptor lug carried on one side edge of the semi-cylindrical body portion, extending axially across a major portion of the axial dimension of the semi-cylindrical body portion, and projecting radially outwardly from the convex outer surface of the body portion at a location immediately adjacent said diametric plane, said female receptor lug having an elongated receptor slot therein extending substantially parallel to the axis of the semi-cylindrical body portion, said receptor slot defining an undercut, radially extending shoulder spaced inwardly in the lug from the face of the lug nearest said diametric plane;

a male engagement tongue carried on the opposite side edge of the semi-cylindrical body portion from the female receptor lug and mounted on the convex outer surface of the body portion, said male engagement tongue projecting substantially tangentially to the convex outer surface and in a direction which is substantially normal to said diametric plane, and on the opposite side of said diametric plane from said body portion, said engagement tongue including an enlarged head; and

a web portion connected to the head and extending axially with respect to, and spaced radially outwardly from, the body portion,

said head being tapered over its radial thickness to facilitate entry into the slot in the female receptor lug when the pair of complementary arcuate sections are snapped together to form a cylindrical connector fitting, and

said male engagement tongue further including a radially extending shoulder at the intersection of the web portion with the enlarged head, said radially extending shoulder disposed on the radially inner side of said web portion; and

a male engaging lug secured to said opposite side edge of the semi-cylindrical body portion and projecting radially outwardly from the convex outer surface thereof at a location to substantially abut said female receptor lug when said pair of complementary arcuate sections are snapped together by interengaging the shoulders carried on said male engagement tongues with the undercut shoulders defined within said female receptor lugs, said male engaging lug connected to said web portion of the male engaging tongue and spacing the web portion and the enlarged head carried thereby radially outwardly from the respective one of said semi-cylindrical body portions upon which said male engaging lug and the male engaging tongue carried thereby are mounted; and

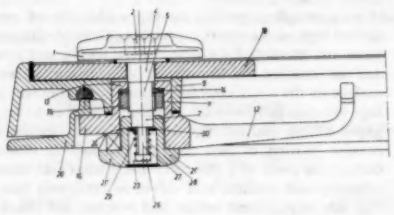
a pair of spaced, flexible, generally semi-cylindrical bands interconnecting the opposite side edges of said body portions, with each one of said bands extending between and interconnecting the male engaging lug on one of said semi-cylindrical body portions with the female receptor lug on the other of said semi-cylindrical body portions, and said semi-circular bands being spaced axially from each other by a distance which is a major portion of the total axial dimension of each of the two semi-cylindrical body portions, said bands yieldingly holding said body portions in variably spaced relation to each other so that said male engaging tongues can enter, and move into, said female receptor slots, and said semi-cylindrical body portions can pivot from an open, spaced apart status, in which said diametric planes of each of said body portions are in coplanar alignment, to a snap-engaged status in which the semi-cylindrical body portions are snap-engaged and about each other to form a generally cylindrical tubular connector fitting.

4,443,032

LOCK FOR BOAT HATCHES OPERABLE BOTH FROM INSIDE AND OUTSIDE

Luciano Bonassi, Saronno, Italy, assignor to C.M.L. Costruzioni Meccaniche Lamazzo S.p.A., Lomazzo, Italy

Filed Mar. 1, 1982, Ser. No. 353,590
Claims priority, application Italy, Jul. 7, 1981, 22292/81[U]
Int. Cl.³ E05C *3/04*
U.S. Cl. 292—202 **5 Claims**



1. A lock for boat shutters and the like operable both from outside and inside of the shutter to open and close a movable shutter with respect to a fixed frame of a hatch, comprising an outer circular plate having a seat for insertion thereinto a square pin of a winch handle, said plate being formed with a shaft extended axially outwardly therefrom and insertable into the shutter from outside, said shaft including a hexagonal head formed at its extremity opposite to said plate; a rotatable handle provided with an opening to receive said shaft therethrough; said handle being formed with a cam engageable with said fixed frame to lock the shutter and being provided with two diametrally opposing recesses; a knob inserted into said handle and provided with a hexagonal cavity in which the hexagonal head of said shaft is engageable, said knob being formed with two diametrally opposing projections engageable in said opposing recesses of said handle; and a spring biasing said knob in the axial direction thereof, said knob being axially shiftable between one position, in which said projections are engaged in said recesses of the handle and the hexagonal cavity engages said head of said shaft whereby a rotary movement

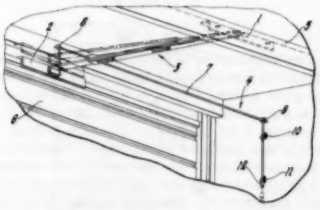
given to said plate by the square pin of the winch handle from outside of the shutter is transmitted to said handle permitting a locking operation from outside, and another position, in which said projections are disengaged from said recesses and said cavity is disengaged from said hexagonal head of the shaft whereby the rotary movement of said plate can not be transmitted to said handle and the operation from outside of the shutter is prevented whereas a locking operation from inside of the shutter by rotation of said handle is permitted.

4,443,033

DOOR SECURING APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Michael A. D'Anna, 25255 Castlewood Dr., Woodhaven, Mich. 48183

Filed Apr. 27, 1981, Ser. No. 257,527
Int. Cl.³ E05C *3/06*
U.S. Cl. 292—235 **9 Claims**



1. A door securing apparatus for an overhead swinging door, comprising:

first means for securing said apparatus to a structural member which is spaced apart a substantial distance in a horizontal direction from a door to be secured, said first means being mounted on said structural member so as to be spaced inwardly from an inner surface of said door at said substantial distance from said door;

second means for selectively engaging an upper portion of said door to be secured, said second means comprising a substantially elongated rigid member having a substantially L-shaped cross section which defines two inner surface portions extending at substantially right angles to each other;

a first one of said inner surface portions of said second means being selectively engageable with a top edge surface of said upper door portion while the second one of said inner surface portions is engageable with an inner-side edge surface of said upper door portion;

third means connected between said first means and said second means for bracing said second means against said upper portion of said door;

said third means comprising a substantially rigid elongated bar member having a length dimension sufficient to span said substantial distance between said structural member and said door, said bar member being rigidly secured adjacent one end thereof to said second means and being hingedly secured adjacent the opposite end thereof to said first means; and

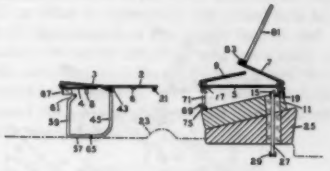
fourth means for selectively moving said second means between a locked position of said apparatus wherein said second means is engaged with and braced against said upper portion of said door to be secured, and an unlocked position of said apparatus wherein said second means is substantially spaced from said upper portion of said door to be secured.

4,443,034

FOLDING PLATFORM AND SHELVES FOR USE IN VEHICLES

George Beggs, Colorado Springs, Colo., assignor to Mechanical Plastics Corp., Pleasantville, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,144
Int. Cl.³ B60N *1/10*
U.S. Cl. 296—65 R **28 Claims**



1. A folding platform for a vehicle having a seat with a folding seat back supported for movement between an upright position and a forward position, the folding platform comprising:

a first series of panels, the edge of a first panel of said first series being affixed to a shaft rotatively fixed in a horizontal direction behind and in parallel proximity to the seat back, the opposite edge of said first panel being hinged to a second panel of said first series of panels, said series of panels being hinged to one another to unfold in the longitudinal direction of the vehicle to rest on vertical support members and fold substantially congruently over said first panel to be rotated as a unit with said shaft;

a second series of panels, a first panel of said second series of panels being horizontally hinged to the seat back and connected to a top vertical extreme of said seat back, said second series of panels being hinged to one another to fold substantially congruently with said first panel of said second series of panels against said seat back, and when said seat back is in the forward position, to unfold in the longitudinal direction of the vehicle to rest on vertical support members whereby a substantially continuous platform with said first series of folding panels is formed, when said first series is unfolded; and

means for horizontally levelling said panel to said seat back when said seat back is folded; wherein

the means for horizontally levelling said panel hinged to said seat back comprises a bar held horizontally and transversely in said vehicle by means of a pair of members attached to said bar, said members having ends pivotally attached to said seat back, and said bar moving from a position against said seat back to a substantially vertical position to engage brackets attached to said panel.

4,443,035

WINDOW ASSEMBLY

Karl L. Saemann, Speyer, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Nov. 20, 1981, Ser. No. 323,327
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107208
Int. Cl.³ B62D *33/06*
U.S. Cl. 296—190 **14 Claims**

1. A window assembly for a vehicle cab, said cab having a first frame which establishes a window area, said first frame having upper and lower surfaces, said window assembly comprising:

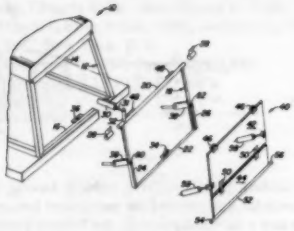
(a) a second frame including a top rail, a bottom rail and a pair of oppositely aligned side guide rails;

(b) first means for pivotably attaching said top rail of said second frame to said upper surface of said first frame;

(c) second means for locking said bottom rail of said second frame to said lower surface of said first frame;

(d) a hydraulic cylinder connected between said cab and said top rail of said second frame, movement of said hydraulic cylinder causing said second frame to pivot relative to said first frame and to retain a given position relative to said first frame; and

(e) upper and lower window sections joined together by a flexible connection which permits said window sections to tilt relative to each other, said upper window section being pivotably connected to said second frame and said



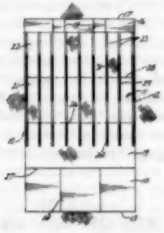
lower window section having an elongated guide member secured to a bottom edge thereof, said guide member having oppositely aligned ends extending longitudinally outward from said lower window section which are slidably received in said pair of guide rails of said second frame for permitting said lower window section to pivot relative to said upper window section as said upper window section pivots outwardly about said top rail of said second frame.

4,443,036

EXPLOSIVE EXPANSION OF FORMATION IN LIFTS FOR FORMING AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jul. 9, 1981, Ser. No. 281,566
Int. Cl.³ E21B *43/24*
U.S. Cl. 299—2 **25 Claims**



1. A method for forming an in situ oil shale retort at a retort site in a subterranean formation containing oil shale, the retort having top, bottom, and side boundaries of unfragmented formation and containing a fragmented permeable mass of formation particles, comprising the steps of:

excavating a void adjacent the bottom boundary of the retort site leaving an overlying zone of unfragmented formation within the side boundaries of the retort site;

placing a first plurality of generally vertical columnar explosive charges in a first horizontally extending array in a first lift of the zone of unfragmented formation above the void;

placing a second plurality of generally vertical columnar explosive charges in a second horizontally extending array in a second lift of the zone of unfragmented formation above the first lift;

detonating the first plurality of explosive charges for explosively expanding the first lift toward the void and forming a first portion of a fragmented permeable mass of formation particles in the retort; and

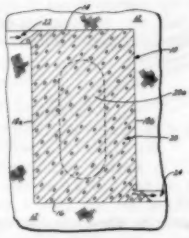
after a time delay of at least about five milliseconds per foot of burden distance of the second plurality of explosive charges, detonating the second plurality of explosive charges in a single round with the first plurality of explosive charges for explosively expanding the second lift toward the void for forming a second portion of the fragmented mass in the retort, the delay interval between explosive charges within the second array being up to about two milliseconds per foot of spacing distance between such explosive charges.

4,443,037

METHOD FOR CONTROLLING VOID FRACTION DISTRIBUTION IN AN IN SITU OIL SHALE RETORT

Thomas E. Ricketts, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Oct. 28, 1981, Ser. No. 316,103
Int. Cl.³ E21B *43/247*; E21C *41/10*
U.S. Cl. 299—2 **13 Claims**



1. A method for forming an in situ oil shale retort in a retort site in a subterranean formation containing oil shale, the in situ oil shale retort site having top, bottom, and side boundaries of unfragmented formation, the method comprising the steps of:

excavating at least one void in the subterranean formation within the boundaries of the retort site while leaving a zone of unfragmented formation within the boundaries of the retort site having a horizontal free face adjacent such a void;

loading explosive into such a zone of unfragmented formation;

detonating the explosive in the zone of unfragmented formation in a time delay sequence in a single round for expanding the zone of unfragmented formation toward such a void for forming a fragmented permeable mass of formation particles within the boundaries of the retort site, comprising the steps of:

detonating explosive near the center of the zone of unfragmented formation; and thereafter

detonating explosive in the zone of unfragmented formation progressing radially outwardly from the center of such a zone to thereby explosively expand the zone of unfragmented formation toward the void for forming the fragmented permeable mass of formation particles in the retort, such a fragmented permeable mass having a lower permeability in a center region of the retort and a higher permeability in outer regions of the retort adjacent the side boundaries;

forming at least one retort inlet adjacent the intersection of a first side boundary of the retort site and the top boundary of the retort site for introduction of a retort inlet mixture; and

forming at least one retort outlet adjacent the intersection of a second side boundary of the retort site and the bottom boundary of the retort site for withdrawal of off-gas, the

second side boundary being on the opposite side of the fragmented mass from the first side boundary.

4,443,038

MINERAL CUTTER TOOL HAVING WATER EMISSION DEFLECTION SURFACE

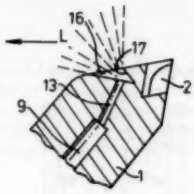
Henry M. Brown, Wendover, England, assignor to Anderson Strathclyde Limited, Buckinghamshire, England

Filed Apr. 6, 1982, Ser. No. 366,064

Claims priority, application United Kingdom, Sep. 19, 1981, 8128387

Int. Cl.³ E21C *35/22*

U.S. Cl. 299—81 **9 Claims**



1. A mineral cutter pick adapted to be mounted on a mineral mining machine and to cut during translational movement in an endless path thereon, which pick comprises a body having a shank of circular cross section for accommodation in a correspondingly shaped recess on a support on a mineral cutting machine to mount the pick on the machine, said shank being adjacent its inner end not substantially less in diameter than at its outer end, the body having a forward end carrying a cutting tip and said body having a passage therethrough for liquid which passage leads from an inlet in the shank to a liquid outlet adjacent to the cutting tip, said pick body having a deflection surface adjacent to said liquid outlet, the arrangement being such that water issuing from said outlet impinges on the deflection surface so that the stream of water is deflected and the formation of a spray enhanced.

4,443,039

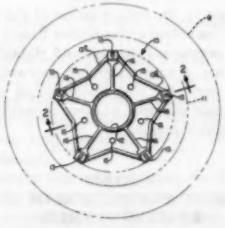
TRAILER WHEEL ADAPTABLE TO AUTOMOBILE HUBS

David L. Loubiere, P.O. Box 363, Addis, La. 70710

Continuation of Ser. No. 371,452, Apr. 23, 1982, abandoned, which is a continuation of Ser. No. 153,460, May 27, 1980, abandoned. This application Oct. 21, 1983, Ser. No. 543,234

Int. Cl.³ B60B *1/06*

U.S. Cl. 301—64 SD **1 Claim**



1. A wheel structure for attaching a mobile home tire and rim to the existing lug bolts on an automobile hub comprising a wheel member consisting of:

a. five spokes, each of which is adapted to contact a mobile home wheel rim on which a rubber tire may be mounted, said five spokes being integrally formed with said wheel and having an integrally formed web therebetween, the outer edge of the web being formed in the shape of a "V", the bottom of the "V" being pointed toward the center of the wheel said outer edge having a riased rib on the outside thereof,

b. a series of five outer bolt holes, each one of said outer bolt holes being located on the end of one spoke, for receipt of means for holding said rim to said wheel structure;

c. a series of five inner lug bolt holes for receipt of lug bolts attached to an automobile hub,

d. a round hole centered in the wheel structure for receipt of an axle or other protuberance, said round hole having a raised rib therearound on the outside thereof, and

e. five raised ribs on the outside of said five spokes, each of said ribs extending from the edge of said raised rib around said round hole to the edge of each of said outer holes, said five raised ribs having a width smaller than the diameter of said five inner lug holes.

4,443,040

HYDRAULIC BOOSTERS FOR VEHICLE BRAKING SYSTEMS

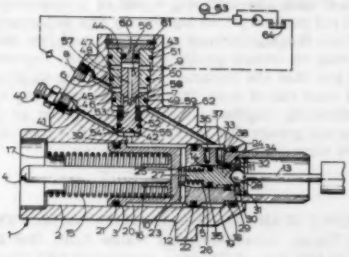
Glyn P. R. Farr, Leek Wootton, England, assignor to Lucas Industries, Birmingham, England

Filed Apr. 12, 1982, Ser. No. 367,336

Claims priority, application United Kingdom, Apr. 23, 1981, 8112631

Int. Cl.³ B60T *13/14*

U.S. Cl. 303—50 **9 Claims**



1. An hydraulic booster for a vehicle braking system comprising a housing provided with a bore, an inlet for connection to a fluid pressure source, and an outlet for connection to a reservoir for fluid, a pedal-operated input piston, a boost piston working in said bore, a boost chamber, pressurisation of which operates said boost piston to provide an output force, boost valve means for controlling pressurisation of said boost chamber by controlling communication between said inlet and said boost chamber and between said outlet and said boost chamber, a control chamber, fluid in said control chamber being pressurised in response to operation of said pedal-operated input piston, said boost valve means being operable in response to pressure in said control chamber, and a recuperation valve for controlling communication between said control chamber and said boost chamber, said input piston including a valve-operating means for closing said recuperation valve to cut off communication between said control chamber and said boost chamber on initial movement of said input piston, said input piston also including means for pressurising fluid trapped in said control chamber following further movement of said input piston, said boost valve means being operative, in response to pressure in the control chamber, to pressurise said boost chamber, and said input piston has a pressure-responsive means on which said pressure in said boost chamber acts such that said valve-operating means is operative to close said recuperation valve.

4,443,041

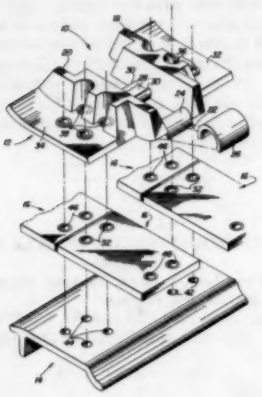
TRACK LINK INCLUDING REMOVABLE SPROCKET-ENGAGING WEAR CAP

William P. Wohlford, Bettendorf, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Feb. 1, 1982, Ser. No. 344,669

Int. Cl.³ B62D *55/28*

U.S. Cl. 305—43 **2 Claims**



2. In a track link including a pair of transversely-spaced upright rail portions joined together by first and second transverse bars, the improvement comprising: said first transverse bar having an arcuate profile of at least 180 degrees and a height less than the diameter of the profile; an arcuate C-shaped wear cap of more than 180 degrees having opposite ends extending lengthwise thereof and defining an opening dimensioned greater than the height of the first transverse bar; and said wear cap being received on the bar.

4,443,042

ROLLING BEARING FOR LENGTHWISE MOVEMENT

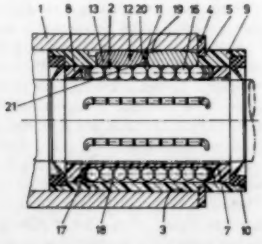
Lothar Walter, Schweinfurt, and Walter Reith, Bad Bocklet, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,294

Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146252

Int. Cl.³ F16C *31/06*

U.S. Cl. 308—6 C **9 Claims**



1. In a rolling bearing for lengthwise movement on a shaft consisting of a cage assembled in the bore of a housing surrounding the shaft, and having at least one longitudinally extending guide slot extending radially therethrough, a rail supported in the bore of the housing outwardly covering the guide slot and load carrying rolling bodies running between longitudinally directed races of the rail and shaft, in which the load carrying rolling bodies are assembled in sequential rows in the guide slots; the improvement wherein the rails are comprised of at least two partial rails individually tiltably supported in the bore of the housing and arranged adjacent to one another in the longitudinal direction.

4,443,043

ELECTRIC MOTOR UNIT

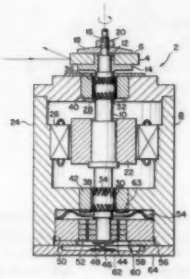
Ryoji Yamaguchi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 26, 1982, Ser. No. 411,959

Claims priority, application Japan, Sep. 9, 1981, 56-142107

Int. Cl.³ F16C *39/06*

U.S. Cl. 308—10 **6 Claims**



1. An electric motor unit comprising:

a motor shaft;

a rotor fixed to the motor shaft;

a stator for rotating the rotor;

a pair of bearings for rotatably supporting both end portions of the motor shaft;

a housing to which the stator and the bearings are fixed;

a ring-shaped first permanent magnet with its inner peripheral surface coaxially fixed to the motor shaft and having one pole on its outer peripheral surface;

a second permanent magnet disposed coaxially with the first permanent magnet in the housing and disposed within the housing so as to be slidable along the axis of the motor shaft, having its inner peripheral surface opposed to the outer peripheral surface of the first permanent magnet, and having on its inner peripheral surface a pole different from the pole on the outer peripheral surface of the first permanent magnet so that the first permanent magnet is attracted by the second permanent magnet in the radial direction of the motor shaft; and

means for adjusting the axial position of the second permanent magnet including a ring holder fixedly mounted with the second permanent magnet and slidably fitted in the motor housing, a screw member screwed in the motor housing to move the ring holder along the axis of the motor shaft, and an elastic member to press the ring holder against the screw member.

4,443,044

BEARING MOUNT AND METHOD OF MOUNTING A BEARING THEREIN

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and William L. Barger, Redwood City, all of Calif., assignors to Tribotech, Redwood City, Calif.

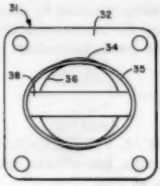
Filed Apr. 11, 1980, Ser. No. 139,251

Int. Cl.³ F16C *13/00, 43/00*

U.S. Cl. 384—428 **6 Claims**

1. A bearing mount and bearing, said bearing mount comprising a flange portion, a bearing receiving seat of elastic ductile material extending outwardly from said flange portion

with one end of said seat being supported by said flange portion and the opposite end of said seat being unsupported, a bearing positioned in said seat, said opposite end of said seat being generally uniform and uninterrupted by insertion slots and having an opening which is smaller than the outer diameter of a bearing to be mounted, said opposite end being permanently deformed by the insertion of said bearing into said opening thereby exerting uneven pressure on the periphery of said mounted bearing after being deformed beyond its elastic limit upon insertion of a bearing therein.



4,443,045

STABILIZED BEARING FOR BOGIES

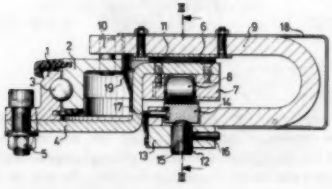
Walter Ketschker; Reinhard Marquart, and Alois Stenert, all of Lippstadt, Fed. Rep. of Germany, assignors to Hoesch Werke AG, Dortmund, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,668

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047464

Int. Cl.³ F16C *19/00*; **B61F** *5/16*; **F16D** *65/38*

U.S. Cl. 308—223 **12 Claims**



1. A swivel bearing for a bogie comprising

a first race ring;

a spring support mounted on the first race ring;

a friction lining attached to the spring;

a first position adjusting element attached to the spring for providing a braking position to the friction lining;

a second race ring engaging the first race ring through rolling elements;

a counter friction lining for engaging the friction lining and wherein the friction lining is freely movable in an axial direction relative to the supporting race ring;

a counter friction lining support element solidly mounted on the second race ring and supporting the counter friction lining and wherein the counter friction lining support element is a clamp spring;

a second position adjusting element attached to the second race ring suitable for engaging the first position adjusting element to provide for a positioning of the friction lining versus the counter friction lining over a desired angle.

4,443,046

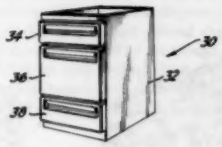
DESK ASSEMBLY

Bruce H. Hannah, Cold Spring, N.Y., assignor to Knoll International, Inc., New York, N.Y.

Division of Ser. No. 153,867, May 28, 1980. This application Sep. 17, 1982, Ser. No. 419,189

Int. Cl.³ A47B *63/00*; **B65D** *57/00*

U.S. Cl. 312—183 **2 Claims**



1. A file drawer compressor or follower comprising a sheet of deformable materials having side pieces and a bridging piece joining said side pieces, said side pieces being biased outwardly and each including a recess in the outside surface thereof having a retaining wall about the periphery thereof for holding a compressible material, so that when said sheet is positioned within a file drawer the compressible material within the recesses of the side pieces bears against the sides of said file drawer.

4,443,047

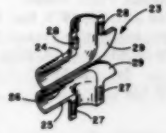
SPARK PLUG WIRING ASSEMBLY

Gloris R. Hofmann, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 28, 1981, Ser. No. 334,949

Int. Cl.³ H01R *13/516*

U.S. Cl. 339—26 **8 Claims**



1. An ignition connection means for connecting a spark plug to a high vo!.age source comprising:

(A) an ignition lead having an outer insulating cover;

(B) a connecting clip means attached to said ignition lead for connection to a spark plug terminal extending generally perpendicular to said ignition lead;

(C) a flexible, L-shaped insulating boot covering said connecting clip means and for covering said spark plug terminal; and

(D) a shell means covering only said insulation boot for limiting bending of said boot while said clip means is being attached or removed from said spark plug terminal to prevent damage to said clip means.

4,443,048

ASSEMBLY WITH VERIFICATION FEATURE

Stanford C. Moist, Jr., Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

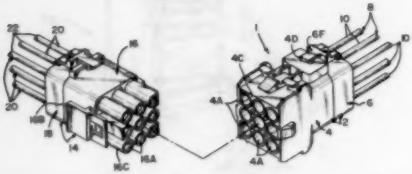
Filed Oct. 2, 1981, Ser. No. 307,997

Int. Cl.³ H01R *11/00*

U.S. Cl. 339—63 M **9 Claims**

1. An electrical connector assembly, comprising a housing having a rearward end and a forward end constructed for

mated connection with a complemenetary housing of another connector assembly, a plurality of cavities extending between the rearward and forward ends, a subassembly in each cavity comprising an elongate electrical conductor connected with an electrical contact, means being provided on the housing and contact to secure each subassembly in a respective cavity, the conductor of each subassembly projecting outwardly of the rearward end of the housing, a retainer adapted to be mounted in the rearward end of the housing, a plurality of passageways



extending through the retainer, the conductors passing through respective passageways, engaging means on the retainer frictionally engaging respective conductors, said engaging means projecting from the retainer and into respective cavities of the housing while the retainer is mounted on the rearward end of the housing, and the retainer being removable from the housing in a rearward direction to withdraw from the housing any subassembly frictionally engaged by the means and that is unsecured for retention in a respective cavity of the housing.

4,443,049

CONNECTOR FOR PORTABLE OBJECTS SUCH AS CREDIT CARDS

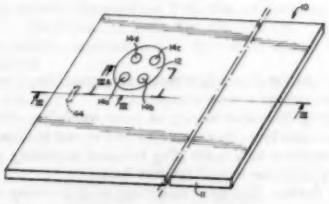
Bertrand J. C. H. De Pommery, St-Nom-La-Breteche, and Jean-Paul C. Goupil, Sevres, both of France, assignors to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 20, 1979, Ser. No. 105,654

Claims priority, application France, Dec. 27, 1978, 78 36544; Mar. 6, 1979, 79 05761; Aug. 14, 1979, 79 20644

Int. Cl.³ H01R *13/635*

U.S. Cl. 339—75 MP **20 Claims**



1. A connector adapted to have a portable object having contact terminals on one surface engaged with contact elements within the connector upon insertion of the object therein comprises a case, a chamber within said case, an opening leading to said chamber and adapted to receive said portable object along a predetermined direction, connecting means in said chamber for connecting said contact terminals of said portable object to the contact elements within the connector upon insertion into said chamber, said means adapted to be actuated from a first stable idle position chamber to said opening to a second operating position away from said opening to electrically connect said object to said connector upon displacement of the portable object within the chamber, said connecting means comprising a first jaw, and a second jaw hinged with said first jaw, said contact elements being resilient and having one extremity fixed to said second jaw and its other extremity free, said connecting means further including an abutment on said seond jaw disposed to engage an extreme section of the portable object on insertion thereof into the connector, means for guiding and tipping said second jaw with respect to the portable object as said jaw is caused to be displaced between the said idle and operating positions by insertion of said portable object so as to cause the contact elements of the connector to land onto respective contact terminals of the portable object.

4,443,050

ELECTRICAL INTERCONNECTORS

John C. Taylor, Ballasalla, Isle of Man, assignor to Strix Limited, Port Erin, Isle of Man

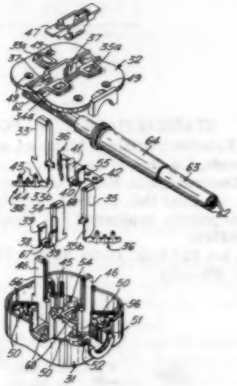
Continuation of Ser. No. 237,137, filed as PCT GB 80/00103, Jun. 13, 1980, published as WO 80/02892, Dec. 24, 1980, § 102(e) date Feb. 10, 1981, abandoned.

This application Apr. 8, 1982, Ser. No. 484,917

Claims priority, application United Kingdom, Jun. 13, 1979, 7920525; Aug. 21, 1979, 7929125

Int. Cl.³ H01R *13/39*

U.S. Cl. 339—99 R **16 Claims**



1. In apparatus for selectively establishing an electrical circuit, the apparatus including at lesat one electrical connector member for engagement with and disengagement from a complementary electrical connector member, the circuit establishing apparatus having a nonconductive housing, a terminal disposed in the housing and being associated with and electrically connected to each electrical connector member whereby each connector member of the circuit establishing apparatus may be electrically connected to an insulated multi-strand conductor by means of said terminal, the improvement comprising said terminal being formed from sheet material and including at least one tooth having a sharp leading end adapted to enter the insulation of an insulated multi-strand conductor from one side, pass through the strand bundle of the electrical conductor and then pass through the insulation at the opposite side to that at which the tooth entered the insulation to make electrical connection with the conductor, said at least one tooth being located in a groove, said groove having at least a first irregularly shaped side wall and a minimum width which is less than the diameter of the insulated electrical conductor whereby said groove defines a trap to receive as a press-fit the insulated electrical conductor, the sharp leading end of the tooth of said terminal being located below the top of said groove whereby the insulated conductor is guided by the groove as it is forced onto said at least one tooth.

4,443,051
TELEPHONE JACK

Hector V. Aguilar, Monterey Park, Calif., assignor to American Telecommunications Corp., El Monte, Calif.

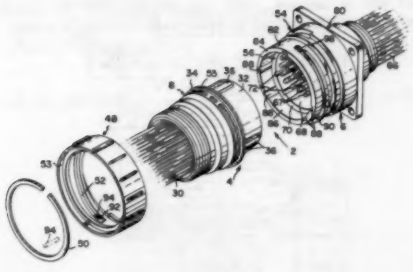
Filed Aug. 1, 1980, Ser. No. 174,541
Int. Cl.³ H01R 13/58
U.S. Cl. 339—107 12 Claims

1. A telephone jack comprising:
a jack frame and socket having a plug-receiving cavity in which a plurality of contacts lie;
a cable comprising a plurality of wires connected at one end to the respective contacts, the cable extending externally from the frame and socket;
a housing partially enclosing the frame and socket, the housing having a first opening that exposes the cavity and a second opening through which the cable passes;
a pair of spaced apart tabs formed on the exterior of the housing, each tab having an opening; and
means for securing the tabs to a telephone set to mount the jack thereon.

4,443,052
MEANS TO INDICATE FULLY-MATED CONDITION OF ELECTRICAL CONNECTOR

Daniel G. Eaby, Mt. Joy, and John R. Shuey, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 5, 1982, Ser. No. 345,962
Int. Cl.³ H01R 13/627, 13/639
U.S. Cl. 339—113 R 15 Claims

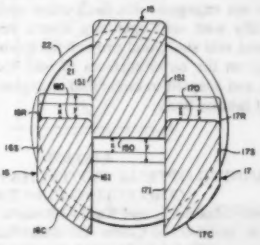


1. An electrical connector of the type comprising:
a first shell;
a first insulating insert secured in said first shell, said first insert having a plurality of passageways extending therethrough;
a second shell having a forward and rearward section, thread means on an outside surface of said forward section;
a second insulating insert secured in said second shell, said second insert having a plurality of passageways extending therethrough;
a plurality of first electrical terminals, each being secured in a respective passageway of said first insert;
a plurality of second electrical terminals, each being secured in a respective passageway of said second insert and being matable with said first electrical terminal; and
coupling means for connecting said first and second shells together so that electrical connection is made between respective ones of said first and second electrical terminals characterized in that:
said coupling means comprises a ring rotatably mounted on said first shell and having thread means threadably engagable with said thread means on said second shell to maintain said shells coupled together, a groove disposed in one of the thread means of said ring or said second shell;
a rod secured in an axial direction in and by the thread means in the other of said ring or said second shell and being tactilely and audibly positioned in said groove to indicate the fully-mated condition of said shells, inserts and electrical terminals.

4,443,053
ELECTRICAL CONTACT

Arthur A. Astbury, Andover, Mass., assignor to Altron Incorporated, Wilmington, Mass.

Filed Aug. 5, 1982, Ser. No. 405,550
Int. Cl.³ H01R 13/42
U.S. Cl. 339—221 R 6 Claims



1. In a compliant contact pin for engagement with the inside of a hollow cylindrical surface and having an intermediate portion with first and second end sections relatively slidable along inside edges with the inside edges of a central section the improvement comprising,
said end sections being formed with curved outside edges along a length at least of the order of half the outside edge length of each section that is to be adjacent the inside surface of the hollow cylinder to be contacted when inserted,
said inside edges of said central and edge sections always being in overlapping relationship over a length less than the length of each inside edge,
whereby each of said end sections may rotate about adjacent corners of said central section when seated in said hollow cylindrical surface to enable the end section outside edges to snugly engage the inside surface of said hollow cylindrical surface.

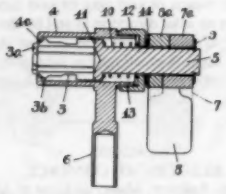
4,443,054
EARTH TERMINAL FOR ELECTRICAL EQUIPMENT

Masashi Ezawa; Hiroshi Makino, both of Kanagawa, and Tadao Futami, Tokyo, all of Japan, assignors to Kanagawa Prefectual Government, Yokohama and Futami Plastic Industrial Co., Ltd., Musashimurayama, both of, Japan

Filed May 20, 1982, Ser. No. 380,437
Claims priority, application Japan, Jun. 1, 1981, 56-079112
Int. Cl.³ H01R 4/52, 4/66, 13/629
U.S. Cl. 339—273 R 3 Claims

1. An earth terminal for electrical equipment which is adapted to be attached to and detached from a ground pin, comprising a collet having locking hooks capable of clamping

a ground pin and engageable with a neck portion thereof; a main tubular body into which said collet is inserted in such a manner that said locking hooks project from a mouth thereof; a connector for an earth conductor, which is formed integrally with said tubular body; a shaft formed integrally with said collet and partially projecting from the rear end of said tubular body; a pair of operating levers through which a rear end portion of said shaft is inserted; a holding member consisting of a stop ring mounted fixedly on a rear tip portion of said shaft



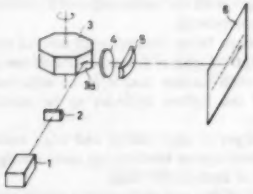
so as to receive one of said operating levers; a coil spring provided around a front end portion of said shaft so as to urge said collet in the forward direction; a pair of annular face cams which are engaged with each other and which are formed integrally with said operating levers, respectively, so as to surround said shaft; and projections having inclined surfaces, formed on the outer surfaces of said locking hooks of said collet, and adapted to come into engagement with said mouth of said tubular body.

4,443,055

SCANNING OPTICAL SYSTEM HAVING A TILTING CORRECTING FUNCTION

Kazuhiko Matsuoka, and Kazuo Minoura, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,458
Claims priority, application Japan, Mar. 3, 1981, 56-30351
Int. Cl.³ G02B *27/17, 3/06*
U.S. Cl. 350—6.5 **6 Claims**



1. A scanning optical system for scanning a medium and having a tilting correcting function, comprising:

means for supplying a light beam;

means having a defleting and reflecting surface for deflecting the light beam from said light beam supplying means in a predetermined direction;

first optical means disposed between said light beam supplying means and said deflecting means for linearly forming the light beam from said light beam supplying means near said deflecting and reflecting surface of said deflecting means; and

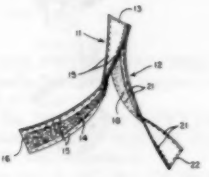
second optical means disposed between said deflecting means and a medium to be scanned for imaging on said medium the light beam deflected by said deflecting means, said second optical means comprising, in succession from the deflector side, a single spherical lens and a single lens having a toric surface, the position of the center of curvature of the surface of said single spherical lens which is adjacent to said deflecting means lying on the side of said medium.

4,443,056

RETROREFLECTIVE DANGLES

Edith Sullivan, 51 Osgood St., Methuen, Mass. 01844

Filed Sep. 30, 1982, Ser. No. 429,548
Int. Cl.³ G02B *5/12*
U.S. Cl. 350—98 **6 Claims**



1. Apparatus for enhancing visibility comprising,

first and second flexible strips each having an outside retroreflective and inside nonretroreflective surface,

means for permanently fastening said first and second retroreflective strips together at one end with the inside nonretroreflective surfaces facing each other,

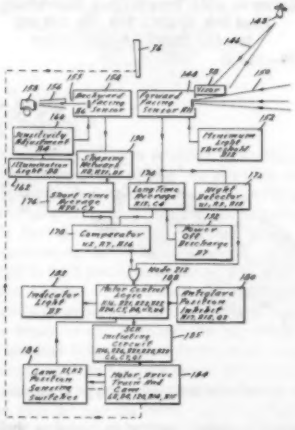
and means for detachably securing at least the free ends of said first and second retroreflective strips together.

4,443,057

AUTOMATIC REARVIEW MIRROR FOR AUTOMOTIVE VEHICLES

Frederick T. Bauer, Holland, and Jon H. Bechtel, Zeeland, both of Mich., assignors to Gentex Corporation, Zeeland, Mich.

Filed Jun. 1, 1981, Ser. No. 268,660
Int. Cl.³ G02B *17/00*
U.S. Cl. 350—281 **44 Claims**



31. In a rearview mirror for an automotive vehicle, the combination including a reflective element having a full reflectance mode and a partial reflectance mode, a housing defining a chamber open in the direction facing the rear of the vehicle, a base disposed at least partially within the chamber defined by said housing, means fixing said reflective element to said housing, means pivotally connecting said housing to said base whereby said reflective element and said housing may be moved as a unit between the full reflectance mode and the partial reflectance mode of said reflective element, and means

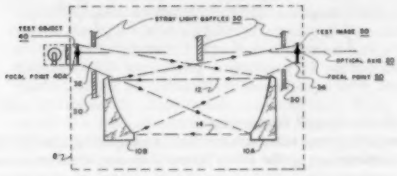
including rotatable DC motor means operable upon multiple revolutions thereof to pivot said housing and reflective element as a unit between said modes relative to said base.

4,443,058

TEST IMAGE PROJECTOR FOR TESTING IMAGING DEVICES

David A. Bosserman, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 22, 1981, Ser. No. 304,505
Int. Cl.³ G02B 5/10
U.S. Cl. 350—294 **9 Claims**



1. A test image projector for testing the resolution of imaging devices, said projector comprising:

means for providing test object points;

optical means comprised of two identical mirrors which are off-axis sections about a common optical axis of said test image projector and are of an astronomical quality parabola which are purely reflective off the front surface thereof for projecting said test object points into a diffraction limited test image; and

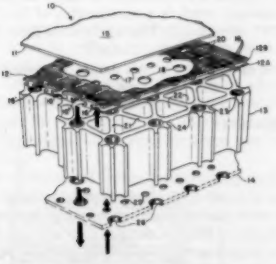
housing means comprised of entrance and exit apertures and stray light baffles wherein said optical means is mounted and optically aligned in cooperative alignment with said entrance and exit apertures, said stray light baffles blocking stray light from said test image whereby the optical axis of said test image projector is aligned with the optical axis of said imaging devices.

4,443,059

HIGH ENERGY LASER MIRROR

Jimmie D. Wells, Northridge, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 13, 1982, Ser. No. 339,257
Int. Cl.³ G02B 5/08
U.S. Cl. 350—310 **2 Claims**



1. A high energy laser mirror structure comprising:

a. a faceplate supporting a mirrored surface;

b. manifold means, adjacent said faceplate, for distributing fluid coolant to said faceplate;

c. a heat exchanger, adjacent said manifold means, comprising a plurality of interconnected wall members configured in a generally isogrid shaped structure defining therebetween a plurality of generally triangular shaped first passageways for conducting fluid coolant to said manifold means, and defining a plurality of second passageways at the intersections of said wall members for conducting coolant fluid from said manifold means; and

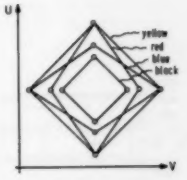
d. a backing plate, attached to said heat exchanger, and including inlet means communicating with said first passageways for conducting fluid coolant into said mirror structure, and outlet means communicating with said second passageways for conducting fluid coolant out of said mirror structure.

4,443,060

RUN-FREE COLOR RASTER FOR MULTI-COLOR PRINTING

Eggert Jung, Schoenberg, and Heinrich Wadle, Neumuenster, both of Fed. Rep. of Germany, assignors to Dr. -Ing. Rudolf Hell GmbH, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,486
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 8110052
Int. Cl.³ G02B 5/20
U.S. Cl. 350—317 **3 Claims**



1. A plurality of color screens for multi-color reproduction with a printing machine wherein the raster positions of a first one of said color screens for a first color are spaced a distance M apart in an axial first direction and are spaced a distance M apart in a second direction transverse to the axial direction, the raster positions of a second one of said color screens for a second color are spaced a distance two-third M apart in said first direction and are spaced a distance M apart in said second direction, the raster positions of a third one of said color screens for a third color are spaced a distance M apart in said first direction and are spaced a distance two-thirds M apart in said second direction, and wherein the raster positions of a fourth one of said color screens for a fourth color are spaced a distance one-half M apart in said second direction.

4,443,061

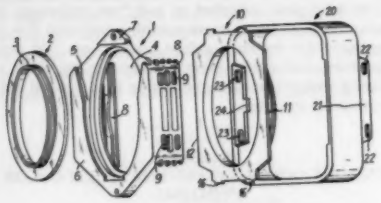
DEVICE FOR HOLDING ACCESSORIES FOR THE LENSES OF APPARATUSES FOR TAKING PHOTOGRAPHS

Jean-Claude Coquin, 15, rue Jean Bologne, 75016 Paris, France

Filed Mar. 18, 1981, Ser. No. 244,951
Claims priority, application France, Mar. 20, 1980, 80 06225
Int. Cl.³ G02B 7/00
U.S. Cl. 350—318 **7 Claims**

1. An accessory-holding device for a still camera having a lens assembly, including a body, an intermediate assembly component from the body onto the lens assembly of the still camera, said assembly component made of a removable annular adaptor ring, equipped with an outer thread for screwing onto the lens assembly, said adaptor ring adapted to being placed inside a corresponding area of said body so as to allow for a relative rotation movement of said body in relation to said lens assembly, said body also displaying, on its side opposite the adaptor ring, said plates having therein at least one pair of grooves making it possible to accommodate a photographic

accessory, characterized by the fact that said device includes at least one adapting component including on the one hand first means for its placement in said corresponding area inside said body to accommodate the adaptor ring, said first means enabling a relative rotation of the adapting component in relation



to said body while ensuring its lateral immobilization inside said body, and on the other hand second means for placing the adapting component between the grooves facing the opposing side plates of the body, said second means enabling sliding displacement in translation motion of the adapting component in relation to said body.

4,443,062

MULTI-LAYER DISPLAY DEVICE WITH NONACTIVE DISPLAY ELEMENT GROUPS

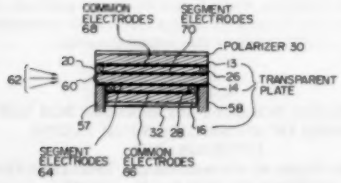
Seigo Togashi; Akira Tsuzuki, and Hiro Fujita, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Sep. 16, 1980, Ser. No. 187,671

Claims priority, application Japan, Sep. 18, 1979, 54-118719; Sep. 18, 1979, 55-118720

Int. Cl.³ G02F 1/133

U.S. Cl. 350—332 13 Claims



1. In a multi-layer liquid crystal display device for displaying a plurality of display patterns each comprising a group of display segments, each of said display segment groups consisting of a common electrode and a plurality of segment electrodes provided in a single layer of said multi-layer display device, the improvement comprising:

electrically connecting the segment electrodes of a first group of display patterns to the segment electrodes of a second group of display patterns, said first group of display patterns being actuated when said second group of display patterns is deactivated, and said first group of display patterns being deactivated when said second group of display patterns is activated.

4,443,063

LIQUID-INJECTION PASSAGE STRUCTURE CONTAINED WITHIN A DISPLAY CELL

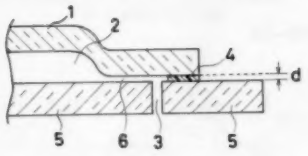
Mitsuru Nishiyama, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 23, 1980, Ser. No. 171,294

Claims priority, application Japan, Jul. 31, 1979, 54-106400[U]

Int. Cl.³ G02F 1/13

U.S. Cl. 350—334 4 Claims



1. A display cell comprising:

first and second substrate means in an opposing spacial relationship one to the other forming in combination a compartment for containing a liquid, said first and second substrate means having an electrode means thereon for providing a visual display, said compartment being reduced in depth at the periphery of said spacial relationship to form a pathway for said liquid, said pathway comprising a concavity formed in at least one of said first and second substrate means at said periphery, said concavity comprising an integral part of said pathway;

an injection hole formed in the periphery of at least one of said first and second substrate means opposite said concavity for introducing said liquid into said pathway; and

a sealing space provided at said periphery of said first and second substrate means lateral to said pathway for receiving a sealing material, said space having a depth less than that of said pathway such that said pathway has an established depth greater than the depth of said sealing space by the amount of said concavity such that said pathway freely conducts said liquid to said compartment.

4,443,064

HIGH RESOLUTION AC SILICON MOS-LIGHT-VALVE SUBSTRATE

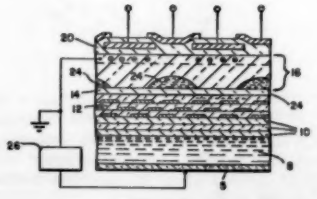
Jan Grinberg, Los Angeles; Michael Waldner, Woodland Hills; Paul O. Braatz, Los Angeles, and Alexander D. Jacobson, Topanga, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Continuation of Ser. No. 99,381, Nov. 30, 1979, Pat. No. 4,239,348, which is a continuation of Ser. No. 967,444, Dec. 7, 1978, abandoned, which is a continuation of Ser. No. 834,856, Sep. 19, 1977, abandoned. This application Dec. 10, 1980, Ser. No. 214,930

The portion of the term of this patent subsequent to Dec. 16, 1997, has been disclaimed.

Int. Cl.³ G02F 1/13

U.S. Cl. 350—334 8 Claims



1. A liquid crystal light valve adapted to be driven by a bias

voltage alternating between two preselected levels for responding to applied information signals, said light valve including in combination:

(a) a liquid crystal layer;

(b) interface means adjacent said liquid crystal layer for reflecting light and inhibiting its passage therethrough;

(c) a light valve substrate structure including a dielectric layer adjacent said interface means and a semiconductor body of predetermined thickness and a first conductivity type and first impurity level adjacent said dielectric layer;

(d) means for applying across said light valve substrate a bias voltage alternating between two preselected levels which depletes said semiconductor body of mobile charge carriers during a portion of the bias cycle whereby a charge depleted region and an electric field are established in said region through which signal representing charge carriers of a second conductivity type in said semiconductor body transfer while said body is depleted of mobile charge carriers under the influence of said electric field; and

(e) a microgrid structure in said semiconductor body comprised of a mesh of intersecting doped regions of said first conductivity type, each of said regions being of a second impurity level, said second level being greater than said first level so that, when said semiconductor body and microgrid are depleted of mobile charge carriers of the first conductivity type, said intersection regions of said microgrid provide a configuration of immobile charge of said second conductivity type to repel said signal-representing charge carriers toward the centers of said intersection regions for improved spatial resolution of said signal.

5. A photoactivated liquid crystal light valve adapted to be driven by a bias voltage alternating between two preselected leads for responding to applied information signals, said light valve comprising:

(a) a semiconductor substrate of predetermined thickness a first conductivity type and a first impurity level having a first surface on which there is a microgrid of said first conductivity type and a second impurity level, said second level being greater than said first level, and a second surface which is exposed to incoming radiation;

(b) a dielectric layer adjacent said first substrate surface;

(c) means for applying across said light valve a bias voltage alternating between two preselected levels whereby said substrate is depleted of mobile charge carriers forming a charge depletion region and an electric field is established throughout said thickness of said substrate during a portion of the bias cycle so that signal representing charge carriers of a second conductivity type generated in said substrate in response to received radiation are transferred through said charge depletion region towards said dielectric layer;

(d) a liquid crystal layer to receive the photoactivated signals; and

(e) interface means between said liquid crystal layer and said dielectric layer to reflect and inhibit the passage of light therebetween.

8. A CCD driven liquid crystal light valve adapted to be driven by a bias voltage alternating between two preselected levels with means for reading out the CCD signal and converting it to a voltage signal alternating between two preselected levels comprising:

(a) a silicon substrate of a first conductivity type and first impurity level on a surface of which there is an epitaxial layer and on an opposed surface of which there is a silicon dioxide layer and in a portion of said substrate adjacent said silicon dioxide layer there is a microgrid of said first conductivity type and a second impurity level, said second level being greater than said first level;

(b) a CCD structure on the top surface of said epitaxial layer;

(c) liquid crystal interface layers adjacent said silicon dioxide layer;

(d) a liquid crystal layer adjacent said interface layers;

(e) a transparent electrode adjacent said liquid crystal layer; and

(f) means for applying a bias voltage alternating between two preselected levels across said transparent electrode and said epitaxial layer whereby said silicon substrate and microgrid are fully depleted of charge carriers during a portion of the bias cycle creating a depletion region and an electric field that extends into a portion of said epitaxial layer so that signal representing charge carriers of a second conductivity type are transferred through said substrate under the influence of said electric field and the regions of immobile charge of said second conductivity type of said microgrid act as a focusing grid for the signal charge carriers.

4,443,065

INTERFERENCE COLOR COMPENSATION DOUBLE LAYERED TWISTED NEMATIC DISPLAY

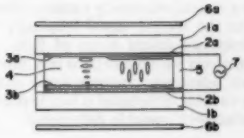
Fumiaki Funada, Yamatokoriyama; Masataka Matsuura, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1981, Ser. No. 327,229

Claims priority, application Japan, Dec. 9, 1980, 55-174406; Jan. 30, 1981, 56-13234

Int. Cl.³ G02F *1/133, 1/137*

U.S. Cl. 350—335 **4 Claims**



1. A double-layered twisted nematic liquid crystal display device which comprises a double layered structure including first and second layers of liquid crystal, the molecules of said liquid crystal having their longitudinal axes which are twisted, the direction of twist in the first layer being different from that in the second layer and wherein the longitudinal axes of the liquid crystal molecules in the first layer are perpendicular to the liquid crystal molecules of the second layer an electrical power supply means for applying a voltage to one of the first and second layers for controlling the orientation of the molecules of the liquid crystal in the first layer, the other of said first and second layers serving as a compensator which compensates for interference coloring, and a polarizing means for visibly enhancing the orientation of the molecules of the liquid crystal in the first layer when the voltage is applied thereto.

4,443,066

ACOUSTO-OPTICAL APPARATUS FOR SHIFTING A BEAM OF LIGHT

Frederick W. Freyre, West Wantagh, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed Jun. 17, 1981, Ser. No. 274,576

Int. Cl.³ G02F *1/11*

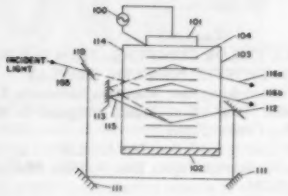
U.S. Cl. 350—358 **8 Claims**

1. Apparatus for shifting a path of a beam of coherent light, comprising:

(a) a first acousto-optical cell including a first transducer connected to a first signal source for launching acoustic waves in said cell, the period between said waves corresponding to the frequency of first signals from said first source, and a first absorber for absorbing acoustic waves which have traversed said cell, the beam of coherent light being incident on said cell at a first selected angle, said first cell diffracting by a first selectively variable angle corre-

sponding to the first signal frequency and frequency shifting by a first selectively variable differential corresponding to the first signal frequency the supplied beam of coherent light to provide a once-diffracted, frequency shifted beam of light; and

(b) a second acousto-optical cell including a second transducer connected to a second signal source for launching acoustic waves in said second cell, the period between said waves corresponding to the frequency of the second signals from said second source, and a second absorber for absorbing acoustic waves which have traversed said second cell, the once-diffracted, frequency-shifted beam of coherent light from said first cell being incident on said second cell at a second selected angle, said second cell diffracting by a second selectively variable angle corresponding to the second signal frequency and frequency shifting by a second selectively variable differential corresponding to the second signal frequency the once-diffracted, frequency-shifted beam of light, wherein said second selectively variable angle is in a direction opposite to said first selectively variable angle and said second selectively variable differential is in a direction opposite to said first selectively variable differential.



4,443,067

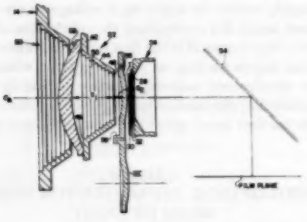
ZONE FOCUSING OPTICAL SYSTEM

R. Calvin Owen, Jr., Lincoln, and William T. Plummer, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 80,432, Oct. 1, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 246,224

Int. Cl.³ G02B *9/04, 9/06, 13/18, 15/02*

U.S. Cl. 350—422 **8 Claims**



1. An optical system for a photographic camera, said optical system consisting essentially of:

an aperture stop having a predetermined diameter;

a first positive meniscus lens element having an aspheric rear surface, said first meniscus lens element having a larger diameter than that of said aperture stop and spaced forwardly thereof;

a second meniscus lens element having an aspheric front surface, said second meniscus lens element having a diameter substantially equal to that of said aperture stop and being located proximate said aperture stop whereby said optical system is nonsymmetric about said aperture stop, said aspheric surface of said first meniscus lens element being structured to favorably correct said optical system for off-axis aberrations and said aspheric surface of said second meniscus lens element being structured to favorably correct said optical system for residual spherical aberrations.

4,443,068

REFLECTING TELEPHOTO ZOOM LENS SYSTEM

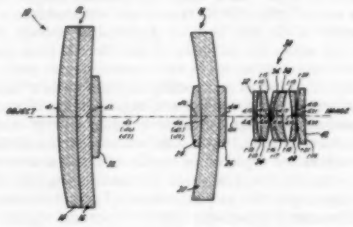
Takayuki Itoh, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1981, Ser. No. 295,236

Claims priority, application Japan, Aug. 30, 1980, 55-119922

Int. Cl.³ G02B *15/14, 17/08*

U.S. Cl. 350—423 **6 Claims**



1. A reflecting telephoto zoom lens system comprising a first lens group having a positive focal length and a second lens group having a negative focal length, said first lens group being located closer to the object than said second lens group, said first lens group being a reflecting lens system with main and auxiliary mirrors, said second lens group being a transmission lens system, said first and said second lens groups being translatable along an optical axis for varying the focal length of the entire optical system while maintaining a fixed image field position.

4,443,069

COMPACT CAMERA LENS SYSTEM WITH A SHORT OVERALL LENGTH

Shin-ichi Mihara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

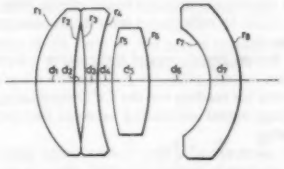
Filed Apr. 13, 1982, Ser. No. 368,092

Claims priority, application Japan, Apr. 15, 1981, 56-56795

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ G02B *9/16, 9/34*

U.S. Cl. 350—469 **7 Claims**



1. A compact camera lens system with a short overall length comprising a first positive meniscus lens component having the convex surface on the object side, a second biconcave lens component, a third biconvex lens component and a fourth negative meniscus lens component, said lens system satisfying the following conditions (1) through (9) when the focal length of the entire system is represented by f, the composite focal length from said first lens component to said third lens component is represented by f_{123}, the focal length of said fourth lens component is represented by f_4, the radius of curvature of the

surface on the object side of said second lens component is represented by r_3, the axial thicknesses of said third and fourth lens component are respectively represented by d_5 and d_7, the airspaces between said first and second lens component is represented by d_2, the airspace between said third and fourth lens components is represented by d_6, the refractive index of said first lens component is represented by n_1 and the Abbe's number of said third lens component is represented by ν_3, and further both surfaces of said fourth lens component being formed as an aspherical surface expressed by the following formula (10) when the direction of the optical axis is represented by x axis, the direction perpendicular to the optical axis is represented by y axis and the para-axial radii of curvature of both surfaces of said fourth lens component are respectively represented by r_7 and r_8:

$$0.55f < f_{123} < 0.70f \quad (1)$$

$$0.7f\ 48\ f_4 < 1.2f \quad (2)$$

$$1.0f < -r_3\ 3.0f \quad (3)$$

$$0.018f > d_2 < 0.035f \quad (4)$$

$$0.06f < d_5 < 0.15f \quad (5)$$

$$0.1f < d_6 < 0.2f \quad (6)$$

$$0.03f < d_7 < 0.1f \quad (7)$$

$$1.63 < n_1 < 1.76 \quad (8)$$

$$\nu_3 < 58 \quad (9)$$

$$x_i = \frac{y_i^2}{r_i + r_i\sqrt{1-(y_i/r_i)^2}} + A_i y_i^4 + B_i y_i^6 + C_i y_i^8 + D_i y_i^{10} \quad (10)$$

wherein reference symbols A_i, B_i, C_i and D_i (i=7, 8) respectively represent coefficients in the above formula and are of the following values respectively:

$$A_7 > -10^2 f^{-3},\ B_7 > -10^3 f^{-5},\ C_7 > -10^4 f^{-7},$$
$$D_7 > -10^7 f^{-9}$$

$$A_8 < -10^{-1} f^{-3},\ B_8 < 10^2 f^{-5},\ C_8 < -10^2 f^{-7},$$
$$D_8 > 10^6 f^9.$$

first and second lens elements are positive meniscus lenses whose convex surfaces are directed towards an object, the third lens element is a negative meniscus lens whose convex surface is directed towards the object, the fourth lens element is a negative lens, the fifth lens element is a positive lens, said fourth lens element and said fifth lens element being connected with each other and constituting a negative meniscus lens whose convex surface is directed towards an image, the sixth lens element is a positive meniscus lens whose convex surface is directed towards said image, and the seventh lens element is a positive biconvex lens, where the radius of curvature of each of the two surfaces of each lens element i, where $1<i<7$, starting at the object side of the lens system is r_{2i-1} and r_{2i} respectively, and the thickness of each said lens element on the optical axis thereof and the air gap between each pair of said lens element is d_i, in order, and the refractive index of each of said lens elements is n_i and Abbe number of each of said lens elements is ν_1, where i=1,2, 3 . . . m; n is an integer, and wherein, with f=100 and an aperture ratio of 1:1.14, a field angle of 46° and a back focal distance of 73.79, the following conditions are met:

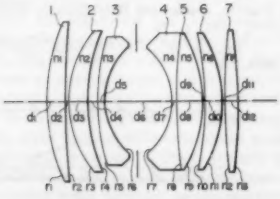
$r_1 = 96.872$			
	$d_1 = 8.42$	$n_1 = 1.77250$	$\nu_1 = 49.62$
$r_2 = 628.489$			
	$d_2 = 0.23$		
$r_3 = 48.086$			
	$d_3 = 8.65$	$n_2 = 1.74400$	$\nu_2 = 44.87$
$r_4 = 81.938$			
	$d_4 = 4.95$		
$r_5 = 114.699$			
	$d_5 = 3.88$	$n_3 = 1.68893$	$\nu_3 = 31.16$
$r_6 = 32.911$			
	$d_6 = 29.54$		
$r_7 = -33.157$			
	$d_7 = 2.33$	$n_4 = 1.74007$	$\nu_4 = 27.76$
$r_8 = 277.242$			
	$d_8 = 12.47$	$n_5 = 1.80610$	$\nu_5 = 40.74$
$r_9 = -56.432$			
	$d_9 = 0.23$		
$r_{10} = -137.843$			
	$d_{10} = 7.62$	$n_6 = 1.80420$	$\nu_6 = 46.50$
$r_{11} = -58.269$			
	$d_{11} = 0.19$		
$r_{12} = 269.964$			
	$d_{12} = 6.05$	$n_7 = 1.72000$	$\nu_7 = 50.34$
$r_{13} = -221.116$			

4,443,070

CAMERA LENS SYSTEM WITH LONG BACK FOCAL DISTANCE AND LARGE APERTURE RATIO

Yoshisato Fujioka, Tokyo, Japan, assignor to Ricoh Col, Ltd., Japan

Continuation-in-part of Ser. No. 41,624, May 23, 1979, abandoned. This application Dec. 8, 1981, Ser. No. 328,505
Claims priority, application Japan, Jun. 5, 1978, 53-66753
Int. Cl.³ G02B 9/62
U.S. Cl. 350—464 **2 Claims**



1. A lens system with a long back focal distance and a great aperture ratio, comprising first through seventh single lens elements and having twelve air instant surfaces, of which the

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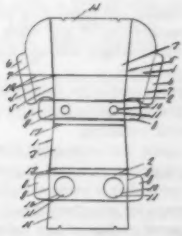
4,443,071

COLLAPSIBLE TELESCOPE

Kosaku Ueda, 8 Hachioji 1-chome, Ikeda-city, Osaka 563, Japan

Filed Dec. 7, 1981, Ser. No. 328,266
Int. Cl.³ G02B 23/18, 7/02
U.S. Cl. 350—546 **7 Claims**



1. A collapsible telescope comprising:
a cylindrically-shaped main body of a quadrangular cross section defined by two long side walls and two short side walls and having folding lines at its angled portions,

at least a lid provided via at least one of said folding lines at one of opposite open-mouthed edges of one of said long side walls of said main body,

an auxiliary folding line formed to extend the full length of said one of said long side walls in a direction parallel with the length of said short side walls of said main body, said auxiliary folding line being positioned in alignment with a folding line which is developed when said two short side walls are stacked on said remaining one of said long side walls and said one of said long side walls is folded, and

lenses fixedly secured around apertures formed in said two short side walls.

4,443,072

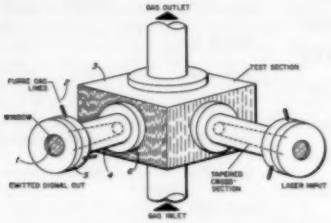
PURGED WINDOW APPARATUS UTILIZING HEATED PURGE GAS

Evan O. Ballard, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 5, 1982, Ser. No. 365,133

Int. Cl.³ G02B *7/00*

U.S. Cl. 350—584 **5 Claims**



1. A purged window apparatus for introducing probing electromagnetic radiation into and retrieving an emitted electromagnetic signal from out of a chamber of flowing gas upon which measurements are being made which enables long-term operation by reducing the necessity of interrupting the flow for the purpose of cleaning or replacing the radiation transmitting window material, said apparatus comprising:

(a) a plurality of tubes with cylindrical inner bore longitudinally tapered for accelerating purging gases with the smaller inner cross-section end directed toward the chamber and that of the larger inner cross-section directed away from the chamber whereon said tubes are externally disposed;

(b) means for rigidly and removably mounting said smaller inner cross-section end of said tubes to the chamber, for providing a vacuum-tight seal, and for exposing said inner bore to the gas flow;

(c) electromagnetic radiation transmitting material which passes with low absorption losses the probing and emitted electromagnetic radiation;

(d) means for rigidly and removably mounting said radiation transmitting material onto said larger inner cross-section end and for providing a vacuum-tight seal;

(e) injection means for introducing said purging gas tangentially to the inner surface of said cylindrical inner bore in the vicinity of said transmitting material and providing a vortex flow thereon and at such pressure that said purging gases flow and accelerate toward the chamber and into the chamber gas flow; and

(f) means for heating said purging gas before it enters said injection means.

4,443,073

DEVICE FOR LENS BOWS OF EYEGLASSES

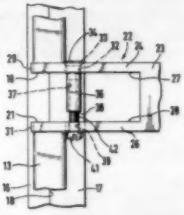
Walter H. Bononi, Zeppelinstrasse 9, Fellbach-Schmiden, Fed. Rep. of Germany

Filed Nov. 10, 1980, Ser. No. 205,568

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1979, 2945905

Int. Cl.³ G02C *1/08*

U.S. Cl. 351—98 **8 Claims**



3. Device to reduce the inner circumference of metal lens bows, comprising

a lens bow having a first area with a through hole oriented approximately in the direction of the mechanical tension in said lens bow, and a second area having an inside threaded portion aligned with said through hole,

said first and second areas having opposed faces thereon,

a sleeve on said second area provided with said inside threaded portion and having a face which forms one of said opposed faces,

a screw having a head resting on the outside of said first area, which is tightened into said inside threaded portion to bring said first and second areas towards each other, up to a point at which said lens bow holds a lens set in said lens bow, at the outer circumference of the lens, with said opposed faces on said first and second areas being spaced from each other,

the shortest effective distance between said opposed faces on said first and second areas being larger in the untightened state and smaller when said screw is tightened to bring said bow into a holding condition about the lens circumference,

said first and second areas comprising legs of a U-shaped profile that provide a bending characteristic, to hold said bow about said lens circumference in accordance with the flexion principle, and

said first and second areas comprising angled, seamless continuations of said lens bow.

4,443,074

METHOD FOR MAKING REINFORCED PLASTICS MATERIAL EYEGLASS FRAMES

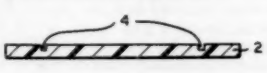
Renato Giacomelli, Piano di Follo, Italy, assignor to MORWEN S.r.l., Piano di Follo, Italy

Filed Feb. 14, 1980, Ser. No. 121,443

Claims priority, application Italy, May 3, 1979, 21494/79[U]; Jun. 20, 1979, 23751 A/79

Int. Cl.³ B32B *31/00*; G02C *13/00*

U.S. Cl. 351—178 **5 Claims**



1. A method of making a reinforced eyeglass frame which comprises the steps of:

(a) forming an outwardly open groove in an unperforated plate of celluloid or cellulose acetate to a depth less than the thickness of said plate and in a pattern such that said groove surrounds regions having the configuration of eyeglass lens and between said regions corresponding to a nose bridge;

(b) inserting a metal reinforcing blade into said groove so that said blade surrounds said regions and extends between said regions;

(c) sealing said groove outwardly of said blade around and between said regions whereby said blade is fully encapsulated in said plate;

(d) thereafter cutting out said regions to define lens-receiving openings surrounded by the fully encapsulated blade; and

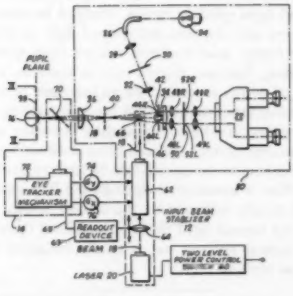
(e) cutting away said plate around and adjacent to said fully encapsulated blade to produce an eyeglass frame configuration having a nose bridge containing a length of the fully encapsulated blade.

4,443,075

STABILIZED VISUAL SYSTEM

Hewitt D. Crane, Portola Valley, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Jun. 26, 1981, Ser. No. 277,626
Int. Cl.³ A61B *3/14*
U.S. Cl. 351—209 **2 Claims**



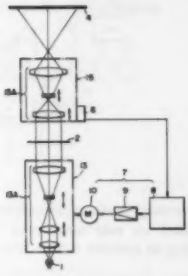
1. A stabilized visual system including fundus illumination and monitoring means simultaneously to illuminate and observe the fundus of an eye, eyetracker means capable of distinguishing between eye translation and rotational movements regardless of the refractive condition of the said eye and continuously measuring changes in position of the said eye, said eye tracker means generating output signals in response to the said changes which signals are a function of the said changes, coherent light beam generating means for generating a coherent input beam, input beam stabilization means positioned to receive the said input beam and to direct the said beam to a selected fixed location in the said eye, said input beam stabilization means including beam directing means and servo means connected to receive the said signals generated by said eyetracker means and move said beam directing means as a function of said changes in position of the said eye, thereby constantly directing the said beam to the said selected fixed locatin in the said eye regardless of eye movements.

4,443,076

PROJECTING APPARATUS

Tatsuo Itabashi, Kanagawa, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,242
Claims priority, application Japan, Oct. 20, 1981, 56-167524; Oct. 20, 1981, 56-167525
Int. Cl.³ G03B *3/10*
U.S. Cl. 353—101 **9 Claims**



1. A projecting apparatus wherein a work on a mount is illuminated by an illuminating device and an image of the shape obtained through a light transmitted therethrough or a light reflected therefrom is formed on a screen by means of a magnifying-projection device, characterized in that a condensing lenses in the illuminating device and a projecting lenses in the magnifying-projection device are formed into zoom type lenses and a tuning device is provided for causing the illuminating scope of the condensing lenses in the illuminating device to correspond to the projecting magnification of the projecting lenses in the magnifying-projecting device, the tuning device comprising:

a magnification setter for generating a magnification signal:

an actuator to actuate the projecting lenses in response to said magnification signal from the magnification setter;

a detecting device secured to the projecting lenses actuated by the actuator, for detecting a magnification thereof and for generating a detection signal; and

actuator to actuate the condensing lenses in response to said detection signal from the detecting device, and to set a magnification corresponding to the magnification thus detected.

4,443,077

FILM CASSETTE AND A PHOTOGRAPHING DEVICE USING THE SAME

Kowji Tanikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 258,946
Claims priority, application Japan, May 2, 1980, 55-58988
Int. Cl.³ G03B *17/26*
U.S. Cl. 354—21 **4 Claims**

1. A film cassette comprising:

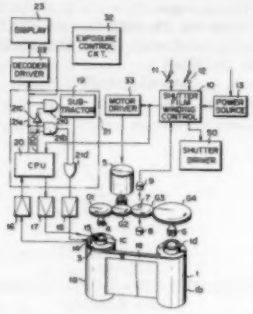
an unexposed film chamber section containing unexposed frames of a film;

a film take-up chamber section having a film take-up spool for winding up the film in said unexposed film chamber section;

a bridge section connecting said unexposed film chamber section and said film take-up chamber section; and

a recording medium attached to at least one of said unexposed film chamber section, said film take-up chamber section and said bridge section, and on and from which film data relative to each one-frame of photographing are

recorded and reproduced thereby to update the film data for each recording;



said recording medium comprising a magnetic disc rotatably mounted on said unexposed film chamber section and rotating in concert with a film winding action.

4,443,078

DISTANCE DETECTING DEVICE IN A CAMERA

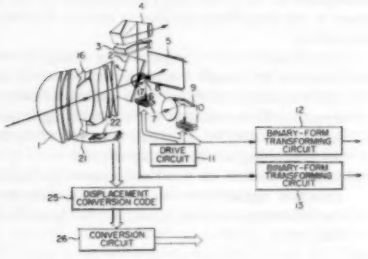
Yukichi Niwa; Yasuo Ogino; Mitsutoshi Oiwada, all of Yokohama; Kazuo Tanaka, Tokyo, and Noboru Koumura, Narashino, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,253

Claims priority, application Japan, Mar. 31, 1981, 56-47614

Int. Cl.³ G03B *3/00*; H04N *5/26*; G01C *3/08*

U.S. Cl. 354—403 **25 Claims**



1. In a camera having a picture-taking lens means, a system for detecting the distance between the camera and an object, comprising:

(A) a first image signal forming means for forming an electrical signal relating to a first detection image obtained by an image of said object formed by said picture-taking lens means;

(B) a range-finding optical means disposed to form an image of said object in accordance with a path different from the object image formed by said picture-taking lens means;

(C) a second image signal forming means for forming an electrical signal relating to a second detection image obtained by the object image formed by said range-finding optical means;

the relative positional relation between said first and second detection images varying in accordance with the change in the distance between the camera and the object; and

(D) circuit means for receiving said electrical signals formed by said first and second image signal forming means and for producing an output indicative of the relative positional relation between said first and second detection images.

4,443,079

METHOD AND APPARATUS FOR DETECTING FOCUS CONDITION OF OBJECTIVE LENS

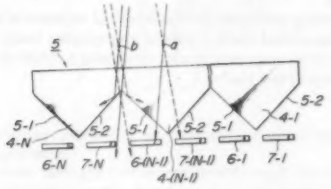
Kenichi Oinoue, Tokyo; Asao Hayashi; Masatoshi Ida, both of Hachioji; Masahiro Aoki, Fussa; Junichi Nakamura, Hachioji, and Kenji Fukuoka, Fussa, all of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 426,898

Claims priority, application Japan, Oct. 6, 1981, 56-159218

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—407 **12 Claims**



1. In a method of detecting a focusing condition of an objective lens for forming an image of an object on a predetermined focal plane by selectively introducing first and second light fluxes each emanating from at least a part of respective one of first and second halves of objective lens divided along a plane including the optical axis of objective lens, onto first and second light receiving means, respectively, and by processing photoelectrically converted outputs supplied from the first and second light receiving means, the improvement comprising

introducing the first and second light fluxes into first and second light splitting means arranged between the objective lens and the first and second light receiving means, respectively, said first and second light splitting means including first and second optical surfaces, respectively, each of which is formed by an interface between higher refractive index material and lower refractive index material viewed in a light propagating direction and said first and second optical surfaces being inclined symmetrically with respect to the optical axis by such angles that the first light flux is transmitted through the first optical surface, but is totally reflected by the second optical surface and that the second light flux is transmitted through the second optical surface, but is totally reflected by the first optical surface.

4,443,080

EXPOSURE CONTROL APPARATUS BASED ON MULTIMETERING SYSTEM

Takashi Saegusa, Sagamihara, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 6, 1981, Ser. No. 319,085

Claims priority, application Japan, Nov. 12, 1980, 55-159166; Nov. 12, 1980, 55-159167

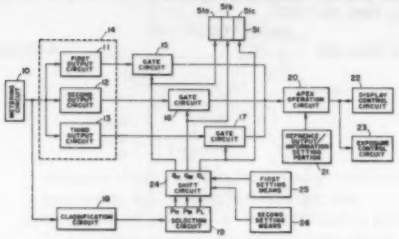
Int. Cl.³ G03B *7/28, 7/08*

U.S. Cl. 354—432 **7 Claims**

1. In an exposure control apparatus including means for producing a plural number of reference outputs having different output levels each depending on a plural number of measured photometric outputs obtained by photometrically and individually measuring lights from a plural number of divided areas of an object field, each photometric output corresponding to each of said divided areas, and selection means for selecting one of said reference outputs so as to control the exposure value for taking a picture of said object field in accor-

dance with said selected reference output, the inprovement comprising:

means for changing the exposure value controlled by said exposure control apparatus, said changing means including means for issuing a signal indicating the direction in which the control should be made selectively to increase or decrease the exposure value and reselection means



operable in response to said indicating signal for reselecting a reference output suitable for carrying out the control in the indicated direction among said plural number of reference outputs, whereby said exposure control apparatus controls the exposure value in accordance with said reselected reference output instead of said selected reference output.

4,443,081

METERING DEVICE OF A SINGLE LENS REFLEX CAMERA

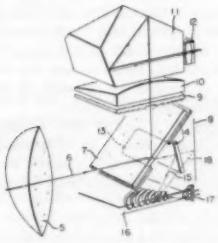
Takashi Suzuki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1982, Ser. No. 371,017

Claims priority, application Japan, May 9, 1981, 56-69769

Int. Cl.³ G03B *7/099*

U.S. Cl. 354—479 **2 Claims**



1. A metering device of a single lens reflex camera comprising:

a picture-taking optical system for forming an image of an object on a picture-taking plane;

a focusing screen disposed at one side of the optical axis of said picture-taking optical system;

a deflector disposed between said picture-taking optical system and said picture-taking plane, at least part of the light from said picture-taking optical system being directed to said focusing screen by said deflector, whereby an object image for observation is formed on said focusing screen; and

a plate-like condensing optical system located outside the light path of said picture-taking optical system between said picture-taking optical system and said picture-taking plane and disposed substantially in parallel to said optical axis, said plate-like condensing optical system having a diffraction grating of arcuate shape, the light from said picture-taking optical system being reflectively directed to said plate-like condensing optical system and refracted to a light receiving element through said plate.

4,443,082

CURRENT SIGNAL CONTROLLED CAMERA SYSTEM

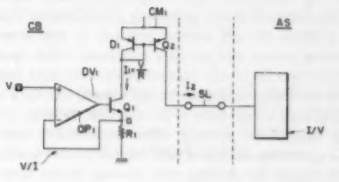
Tamio Murano, Itami; Satoshi Yamane, Kobe; Toshitatsu Suzuki, Takarazuka, and Yoshio Fukushima, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jul. 22, 1982, Ser. No. 400,623

Claims priority, application Japan, Jul. 23, 1981, 56-109659[U]

Int. Cl.³ G03B *1/00, 15/05, 17/00*

U.S. Cl. 354—145.1 **10 Claims**



1. A camera system in which information is transmitted in the form of current comprising:

a camera body including a first voltage source;

an accessory to be used in association with said camera body, said accessory including a second voltage source;

a voltage-to-current converter incorporated in at least either one of said camera body and accessory for converting a voltage into a current signal;

means for transmitting said current signal to the other of said camera body and accessory; and

a current-to-voltage converter incorporated in at least the other of said camera body and accessory for converting said current signal thus transmitted back into a voltage signal whereby information is transmitted from either one of said camera body and accessory to the other in the form of current.

4,443,083

DRIVING APPARATUS IN A CAMERA

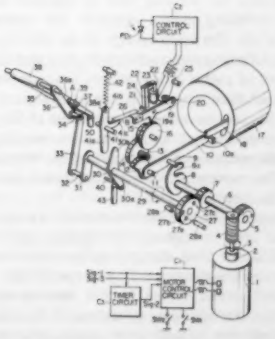
Yoshiyuki Nakano, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 357,813

Claims priority, application Japan, Mar. 19, 1981, 56-40190; Mar. 19, 1981, 56-40191

Int. Cl.³ G03B *19/12*

U.S. Cl. 354—152 **12 Claims**



1. A single lens reflex camera having a reflecting mirror

which moves during operation from a position across the light path of a light beam travelling toward a film surface past the stop of a phototaking lens to a position retracted from said light path, an apparatus for driving the stop of said phototaking lens for the control of said stop to a predetermined aperture value and for the control of the movement of said reflecting mirror and means for causing exposure of the film surface to the light beam passing the stop, said apparatus comprising:

(a) stop-down operating means capable of being coupled to said stop and displaceable between a first position for providing a maximum aperture opening to said stop and a second position for providing a minimum aperture opening to said stop;

(b) moving means having a first moving area capable of moving forward while imparting displacement from said first position to said second position to said stop-down operating means and moving backward while imparting displacement from said second position to said first position to said stop-down operating means, having a second moving area continuous with said first moving area and being capable of moving while maintaining said stop-down operating means in said second position; and

(c) drive means for driving said moving means forward in said first moving area before the exposure of light to said film surface and subsequently driving said moving means into said second moving area, said drive means including means for retracting said reflecting mirror into said retracted position while said moving means is in said second moving area.

4,443,084

FILM WINDING DEVICE

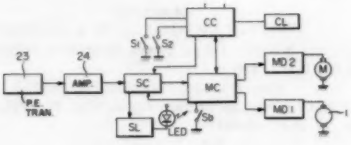
Toshimitsu Harada, and Koji Watanabe, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 15, 1981, Ser. No. 311,659

Claims priority, application Japan, Oct. 31, 1980, 55-152155

Int. Cl.³ G03B *1/12*

U.S. Cl. 354—173.11 **4 Claims**



1. In a device for winding film in response to a winding signal and including means operable for causing winding movement of the film upon receipt of the winding signal,

means for detecting movement of the film and for generating an output of pulses quantitatively in accordance with the amount of film movement, a predetermined number of said pulses corresponding to one frame of film movement,

control circuit means for receiving the winding signal and said pulse output and for operating the winding means to cause film movement until said predetermined number of pulses has been received, and

timer means connected to the control circuit means and actuated upon receipt of the winding signal for a time interval longer than that normally required to wind the film an amount corresponding to one frame,

said control circuit means further monitoring said timer means and discontinuing operation of the winding means upon expiration of said timer means interval when said predetermined number of pulses have not yet been received.

4,443,085

CAMERA WITH AN INTERCHANGEABLE LENS

Yasumasa Tomori, Sakado; Mituhiko Shimoda, Asaka, and Keisuke Haraguchi, Ranzan, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

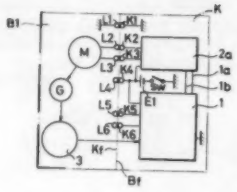
Continuation of Ser. No. 267,697, May 27, 1981, abandoned.

This application Sep. 15, 1982, Ser. No. 418,568

Claims priority, application Japan, Jun. 11, 1980, 55-78856; Jun. 11, 1980, 55-78857

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—402 **6 Claims**



1. In a camera system with a camera body and a plurality of interchangeable lens barrels, the camera body having a lens mount and a focus detecting device for detecting when the sharpest image is formed on a film plane therein, each lens having focusing means for imaging an object on the film plane, a focusing motor connected to movable elements in each lens barrel, the improvement comprising:

a control circuit inside said camera body connected to the output of said focus detecting device and having an output for directly driving and controlling said focusing motor;

electrical terminals on said camera body mount, a first set of terminals connected to the output of said focus detecting device and a second set of terminals connected to the output of said control circuit within said camera body;

electrical contacts on each lens barrel, at least one lens barrel of a first type having contacts located to mate with said first set of terminals on said body mount, said first type of lens barrel including a control circuit inside the lens barrel for interpreting the output of said focus detecting means and producing an output which drives and controls the focusing motor of the lens barrel so that the focusing of the lens barrel is controlled by circuitry in the lens in response to said focus detecting means;

at least one lens barrel of a second type having contacts located to mate with said second set of terminals on said body and connected to the focusing motor, so that only the control circuit within the camera body focuses the lens barrel directly.

4,443,086

FOCUS ADJUSTING DEVICE

Kazuya Hosoe; Takao Kinoshita; Nobuhiko Shinoda; Shinji Sakai, all of Tokyo; Takashi Kawabata, and Tadashi Ito, both of Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 150,958, May 19, 1980, abandoned.

This application Dec. 14, 1981, Ser. No. 330,438

Claims priority, application Japan, May 23, 1979, 54-63373

Int. Cl.³ G03B *3/00, 13/18*

U.S. Cl. 354—409 **7 Claims**

1. An automatic focusing lens assembly for use with a camera body, comprising:

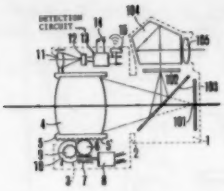
(a) a focus adjustable lens system;

(b) an automatic focusing device for automatically focusing said lens system onto an object to be photographed;

(c) aural indication means coupled to said automatic focusing device to aurally indicate the focusing condition of the lens system with respect to the object, said aural indication means being arranged to produce respectively differ-

ent indications indicative of in-focus and out-of-focus conditions of the lens system;

visual indication means coupled to said automatic focusing



device to visually indicate the focusing condition of the lens system with respect to the object; and

guide means for guiding the visual information generated by said visual indication means into said camera body.

4,443,087

FOCUS STATE INDICATOR

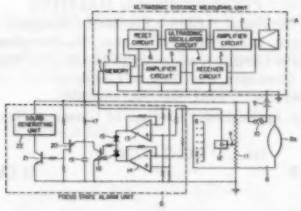
Toshitsugu Kashihara; Tsunemi Yoshino, both of Nara; Akitoshi Morioka, Osaka, and Hiroshi Iwata, Nara, all of Japan, assignors to West Electric Co., Ltd., Oyodo, Japan

Filed Sep. 21, 1982, Ser. No. 420,859

Claims priority, application Japan, Sep. 21, 1981, 56-150338

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—401 **3 Claims**



1. A focus state indicator comprising: distance measuring means for converting distance data from a camera to a subject to be photographed to a first electrical signal; lens position detecting means for producing a second electrical signal corresponding to a position of a photographic lens; first and second differential amplifier circuits which respectively receive the first and second electrical signals in an inverted relation; switching means comprising a transistor which simultaneously receives outputs from said first and second differential amplifier circuits through first and second rectifying means respectively and a switch circuit which is controlled by said transistor; and an alarm element such as a sound generating unit which is controlled by said switching means, an alarm mode of said alarm element being successively changed in accordance with the degree of focus detected by first and second electrical signals.

4,443,088

FOCUSING SCREEN

Keiji Ohtaka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,704

Claims priority, application Japan, Nov. 25, 1980, 55-165557

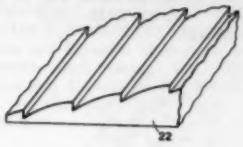
Int. Cl.³ G02B *5/04*; G03B *13/28*

U.S. Cl. 354—200 **4 Claims**

1. In a split image type range finder system having an objective lens for forming an image plane, a focusing screen comprising:

a plurality of light deflecting portions each of which includes:

(a) a prism component having a light deflecting function for providing part of an out-of-focus image with displacement in one direction; and



(b) a diffraction grating component formed on said prism component and having a plurality of unit structures, at least a portion of each of said plurality of structures being formed by a curved surface.

4,443,089

FILM WINDING AND REWINDING DEVICE FOR CAMERA

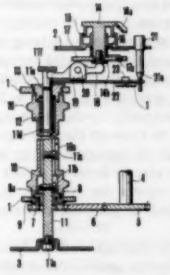
Akio Sunouchi, Tokyo; Tatsuo Konno, Kanagawa; Masahisa Fujino, Tokyo, and Ryuji Suzuki, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed May 28, 1982, Ser. No. 383,249

Claims priority, application Japan, Jun. 11, 1981, 56-90130

Int. Cl.³ G03B *1/00*

U.S. Cl. 354—214 **9 Claims**



1. A film winding and rewinding device for a camera comprising:

changeover means for changing over the camera from the winding mode to the rewinding mode;

operating means movable in a first direction and in a second direction, said operating means when manually moved in said first direction making said changeover means ready to be actuated, and when said movement in said first direction is followed by a movement in said second direction, actuating said changeover means;

cover means for having a guide hole for said operating means, said changeover means being covered by said cover means; and

locking means for preventing said operating means from moving in said second direction, and when said operating means is moved in said first direction, for allowing said operating means to move in said second direction, said locking means being covered by said cover means.

4,443,090

ELECTROMAGNETIC TRANSMITTING APPARATUS FOR A CAMERA

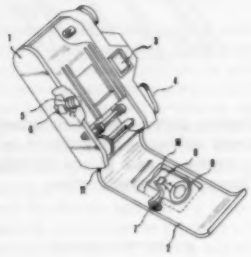
Hideaki Miyakawa; Yasuki Takahashi, both of Kanagawa, and Fumio Hata, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 293,945

Claims priority, application Japan, Aug. 26, 1980, 55-117367

Int. Cl.³ G03B *17/00*

U.S. Cl. 354—289.12 **6 Claims**



1. An apparatus to transmit electric power between a photo-taking device and an accessory associated with the device, comprising:

(a) a main body forming a part of the photo-taking device;

(b) electric power supplying means provided within said main body, said electric power supplying means including first conversion means to convert electric power from a power source associated with said electric power supplying means into a magnetic signal by electromagnetic induction; and

(c) electric power receiving means provided within the accessory, said electric power receiving means including second conversion means to convert the magnetic signal from said electric power supplying means to an electric signal when said first and said second conversion means are in magnetic coupling relation with one another.

4. An apparatus according to claim **1**, **2** or **3**, which further comprises a first magnetic circuit forming a part of said first conversion means to convert electric signals produced at the photo-taking device or camera side into magnetic signals, and a second magnetic circuit forming a part of said second conversion means to receive the magnetic signals from said first magnetic circuit and to generate corresponding electric signals.

5. An apparatus according to claim **4**, in which said first and second magnetic circuits include cores made of magnetic material and coils wound around said cores, so that said cores can be operatively placed in closely opposing relation to form a closed loop magnetic circuit.

6. An apparatus according to claim **5**, in which the accessory or the back lid includes a sound emitting body for emitting sound in response to the signals from said second magnetic circuit.

4,443,091

YOKE MECHANISM OF ELECTROPHOTOGRAPHIC PRINTING APPARATUS

Masayuki Ainoya; Hiroomi Kozawa, and Takao Chikuzenya, all of Ibaraki, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

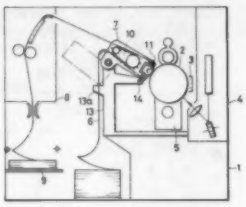
Filed Jun. 21, 1982, Ser. No. 390,431

Int. Cl.³ G03G *15/16*

U.S. Cl. 355—3 TR **6 Claims**

1. A yoke mechanism for an electrophotographic printing apparatus, comprising:

yoke means including a tractor, said yoke means being pivotably mounted on a frame for movement between a retracted position and a transfer position, and engagement means for stopping said yoke means at an intermediate



position between said retracted and transfer positions to facilitate the loading of printing paper onto said yoke means.

4,443,092

COMPACT PHOTOCOPYING MACHINE

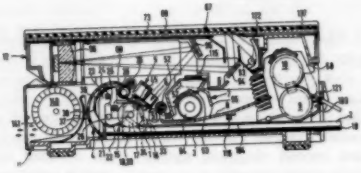
Jüergen Eisbein, Gerlingen; Heinrich Kaufmann, Stuttgart; Kurt Moser, Gerlingen, and Friedhelm Brenner, Reichartshausen, all of Fed. Rep. of Germany, assignors to Develop Dr. Eisbein GmbH & Co., Gerlingen, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 414,269

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136206

Int. Cl.³ G03G *15/20*

U.S. Cl. 355—3 R **38 Claims**



37. Photocopying machine comprising:

a machine housing,

a receiver in said machine housing for receiving copying paper,

a separating station for separating individual sheets of paper from said copying paper,

a charging station for charging said sheets of paper,

an exposing station including an exposing window,

a movable slide block with a holder for an original to be copied,

an optical system for transmitting images from the original to the exposing window,

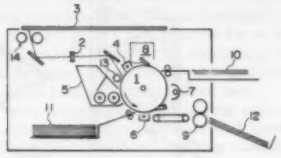
a developing station including a magnet roller,

a fixing station including a pair of pressing rollers, wherein two elastically deformable bearing blocks are provided at the lower machine housing part for the pressing rollers, said bearing blocks each being constructed as one part units with shell formed bearing seats for the bearings of the upper and lower pressing rollers.

4,443,093
ELECTROSTATIC PRINTING METHOD

Masaki Yoshino; Kozo Oka, and Huminori Koide, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1982, Ser. No. 415,622
Claims priority, application Japan, Sep. 7, 1981, 56-139816
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 CH 8 Claims



1. An electrostatic printing method, comprising; forming a printing master having a fixed toner image on a photo-conductive plate;

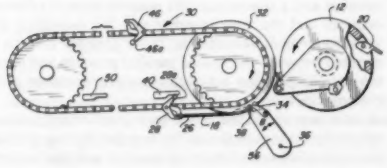
repeatedly charging said printing master with a light source maintained off until a potential from 0.7 to 1.3 times a practical potential is given thereto, and then charging said printing master with said light source turned on, to thereby recover an image region potential of said printing master; and

printing using said printing master.

4,443,094
DUPLICATING MACHINE WITH DUPLEXING CAPABILITY

Mario Ricciardi, Glenview, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Nov. 22, 1982, Ser. No. 443,814
Int. Cl.³ G03G 15/00
U.S. Cl. 355—3 SH 23 Claims



1. In a duplicating machine for duplicating images on both sides of copy sheets including a blanket cylinder having first and second images transferable to the copy sheets, an impression cylinder forming a nip with the blanket cylinder and for supporting and transferring the copy sheets through the nip, and means for feeding copy sheets to the impression cylinder, means for handling said sheets for duplexing said images thereon comprising:

first gripper means on said impression cylinder for releasably engaging a lead end of a copy sheet and moving the sheet through said nip to transfer the first image to a first side of the sheet;

transport gripper means for releasably engaging the lead end of the sheet transferred thereto by said first gripper means and transporting the sheet in a direction away from the impression cylinder;

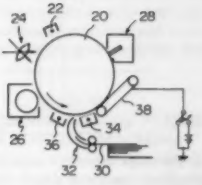
swing gripper means for releasably engaging a trail end of the sheet in timed relation with release of the sheet by said transport gripper means and re-feeding the sheet back to the impression cylinder; and

second gripper means on the impression cylinder for releasably engaging said trail end of the sheet and moving the sheet through the nip to transfer the second image to a second side of the sheet.

4,443,095
IMAGE TRANSFER AND SHEET SEPARATION APPARATUS FOR ELECTROPHOTOGRAPHIC SYSTEM

Shuichi Tsushima, and Fuyuhiko Matsumoto, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,653
Int. Cl.³ G03G 15/01, 15/14
U.S. Cl. 355—14 R 26 Claims



1. An image transfer and sheet separation apparatus for an electrophotographic system, comprising:

(a) a photoconductive member on which a latent image is to be formed electrostatically;

(b) developing menas for developing the latent image with a toner into a toner image;

(c) a transfer charging means for transferring the toner image onto a transfer medium;

(d) a precharging means located between the developing means and the transfer charging means; and

(e) a conductive member so positioned downstream of the transfer charging means as to be intimately engaged by the transfer medium, the conductive member being moved in a same direction and at a same speed as the transfer medium at a point of engagement therewith.

4,443,096
ON MACHINE RETICLE INSPECTION DEVICE

Karl-Heinz Johannsmeier, Los Altos, and Edward H. Phillips, Middletown, both of Calif., assignors to Optimetrix Corporation, Mountain View, Calif.

Filed May 18, 1981, Ser. No. 264,410
Int. Cl.³ G03B 27/42
U.S. Cl. 355—53 19 Claims

1. A projection alignment and exposure apparatus comprising:

means for holding a pattern bearing element;

a source of light for illuminating the pattern bearing element;

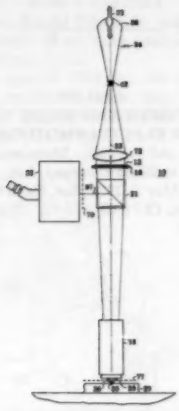
a moveable stage for holding a workpiece to be aligned with respect to the pattern bearing element;

optical means for projecting an image of a pattern on the pattern bearing element onto the stage;

a first apertured optical detector supported on the stage to detect a portion of the projected image of the pattern on the pattern bearing element;

a second apertured optical detector supported on the stage in spaced relationship with the first apertured optical detector to detect another portion of the projected image of the pattern on the pattern bearing element; and

means for indicating differences in the detected portions of the projected image of the pattern on the pattern bearing



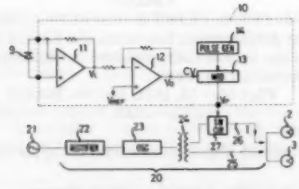
element as the stage is moved to scan the first and second apertured optical detectors across that projected image.

4,443,097

EXPOSURE VALUE CONTROL SYSTEM FOR COPYING MACHINES

Kiyoto Nagasawa, Yokohama, and Hiroshi Yamada, Ichikawa, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Aug. 19, 1981, Ser. No. 294,140
Claims priority, application Japan, Aug. 23, 1980, 55-115350
Int. Cl.³ G03B 27/72
U.S. Cl. 355—68 6 Claims



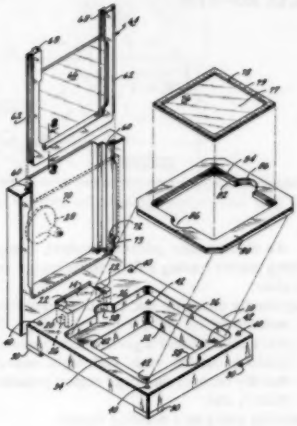
1. An exposure device for an electrophotographic apparatus, comprising a fluorescent lamp, a fiber array for focusing light from said lamp onto a photosensitive member, means for generating a DC voltage, and means receiving said DC voltage for adjusting the level of current supplied to said lamp according to the level of said DC voltage, including means for supplying power to said fluorescent lamp, said powersupply means including a high-frequency oscillator generating alternating current of a high-frequency for driving said lamp, and said adjusting means including gate means interposed in the current supply line to said lamp for periodically preventing current flow to said lamp when said gate means is disabled.

4,443,098

PELLICLE MOUNTING FIXTURE

Craig M. Walwyn, and Donald E. Bohonos, both of San Jose, Calif., assignors to General Signal Corporation, Stamford, Conn.

Filed Dec. 21, 1982, Ser. No. 451,780
Int. Cl.³ G03B 27/58
U.S. Cl. 355—74 26 Claims



1. A pellicle mounting fixture for affixing a pellicle to a mask, including

a base member and a cover member and with the base member including means for receiving a pellicle and with the cover member including means for supporting a mask,

a guide means connected to the base member and the cover member for providing rotational movement between the cover member and the base member between an upstanding position for the cover member relative to the base member and a spaced parallel position between the cover member and the base member and for providing transverse movement between the cover member and the base member between the spaced parallel position and a touching parallel position between the cover member and the base member, and

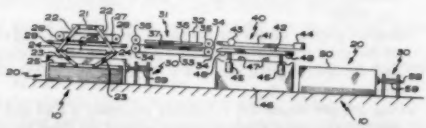
resilient means connected to the base member and projecting upwardly to engage the cover member during transverse movement between the cover member and the base member.

4,443,099

PHOTOGRAPHIC PRINTING SYSTEM

Dale L. Linman, Minneapolis, and Stephen A. Bartz, Jordan, both of Minn., assignors to Lucht Engineering Corporation, Minneapolis, Minn.

Filed Feb. 17, 1982, Ser. No. 349,650
Int. Cl.³ G03B 27/62
U.S. Cl. 355—75 19 Claims



1. In a photographic printer of the type wherein a transparency bearing an image to be printed is positioned within the optical path of the printer, the transparency being carried by a masking card with the image to be printed at an aperture

thereof and the card contributing to registration of the image within the printer optical path, an improved card handling system which comprises:

first card receptacle means for retaining a plurality of said masking cards each in stacking relation to others of said masking cards;

printing station means generally at the optical path of said printer;

card transport means including means for individually lifting a top masking card from said first card receptacle means, means pivotable between a first position for accepting a lifted card and a second position for providing a track for an accepted card and means for conveying cards within said track to said printing station means; and

second card receptacle means for receiving said masking cards from said printing station means, said printing station means including means for ejecting masking cards therefrom.

4,443,100

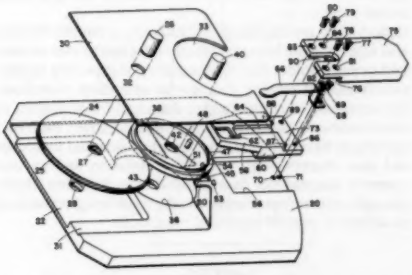
INDEXING APPARATUS FOR POSITIONING AND RETAINING A DISK FILM

Paul Zamek, Washington Township., Berden County, N.J., assignor to Design Controls Corporation, Little Falls, N.J.

Filed May 14, 1982, Ser. No. 378,243

Int. Cl.³ G03B *27/62, 27/64*

U.S. Cl. 355—76 **26 Claims**



1. Apparatus for positioning and releasably holding a disk film characterized as having a multiplicity of developed negatives arranged in a radial array, this apparatus adapted to receive one negative portion at a time and to releasably grip said film negative above and below so as to provide in a gripped condition a determined flat plane in which the negative is held, this apparatus disposed to accept one film disk at a time and to fixedly position said disk on a rotatable support member, said apparatus including:

(a) a support base;

(b) a drive disk-like member rotatably carried by said support base;

(c) a support disk member rotatably carried by said support base, said member having an outwardly projecting circular and radially positioned portion adapted to engage and support an underside portion of the disk film;

(d) drive means for moving the support disk member by and in relation to the movement of the drive disk member;

(e) means provided on the support base for engaging the underside of the disk film along the lateral extents thereof and an aperture formed in this support means of the base, and adjacent this aperture and outward of the aperture providing a support of the outer portion of the disk film so as to support the developed negative when moved thereagainst, this underside support establishing a determined support plane;

(f) means provided on the drive disk member to positively rotate said support disk member as the drive disk member is rotated;

(g) a lift member pivotally retained by and carried by the support base, said lift member having an aperture therethrough and with the aperture formed in the support base and providing means for an illuminating path through the positioned and held negative portion of the disk film, said lift member urged towards the support base and into a gripping condition by bias means, said bias means a leaf spring secured at one end to said support base, the lift member also including a support portion extending toward the support base and carried in and by guide means provided with and by said support base and with the leaf spring providing guide means and limits of motion for the lift member which is selectively movable from said gripping condition, said lift member having its underside adapted to provide a gripping surface for the outer surface of the disk film as and when said disk film is gripped, and

(h) means carried by the support base and disposed to engage the film as it is rotated so as to precisely position said film when in an engaged condition and to release said film from said precise and gripped condition during rotation.

4,443,101

RECORDING PAPER SEPARATION FAILURE RELEASE FOR COPYING MACHINE

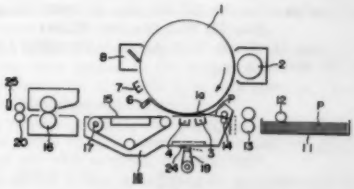
Isao Sakurai, Hamura, and Teruo Minejima, Higashi Murayama, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,207

Claims priority, application Japan, Oct. 30, 1980, 55-153335; Nov. 20, 1980, 55-164267

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **8 Claims**



1. In a copying machine in which a toner image is transferred from an image retaining member to a recording paper and, after the transfer of said toner image, said recording paper is separated from said image retaining member by the operation of a first separation means and ejected to the outside of said machine, the improvement comprising: a detection means for detecting a separation failure of said recording paper, a recording paper conveying means displaceable to open the passage of said recording paper, and a second separation means for separating, from said image retaining member, said recording paper which is attaching to said image retaining member due to said separation failure, said detection means being adapted to produce a detection signal for displacing said recording paper conveying means to open said passage of said recording paper and to actuate said second separation means so as to separate said recording paper onto said conveying means, said conveying means being adapted to be reset thereafter to the ordinary position thereby to release the separation failure.

4,443,102

COMPACT DEVELOPMENT SYSTEM

Richard A. Lux, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

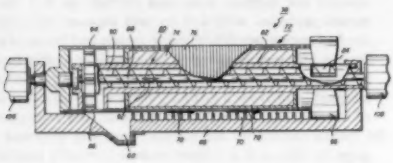
Filed Apr. 28, 1982, Ser. No. 372,503

Int. Cl.³ G03G *15/08*

U.S. Cl. 355—3 DD **22 Claims**

1. An apparatus for developing a latent image recorded on a surface, including:

means for transporting marking particles through a path in which the marking particles rotate and translate in the portion of the path remote from the surface and rotate in the portion of the path adjacent the surface so that the latent image attracts at least a portion of the marking particles thereto forming a particle image on the surface as marking particles translate from a receiving region to a



discharge region said transporting means includes a rotatably mounted elongated sleeve and a housing having a portion of the interior surface thereof adjacent to a portion of said sleeve with said housing having a plurality of grooves in the portion of the interior surface thereof adjacent said sleve with each groove being transverse to the longitudinal axis of said sleeve; and

means for attracting the marking particles to said sleeve.

4,443,103

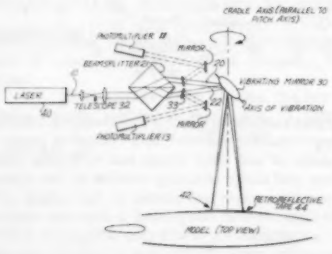
RETRO-REFLECTIVE ELECTRO-OPTICAL ANGLE MEASURING SYSTEM

Joachim C. Erdmann, Seattle, Wash., and Robert I. Gellert, Quesnel, Canada, assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 217,733, Dec. 18, 1980. This application May 31, 1983, Ser. No. 481,041

Int. Cl.³ G01B *11/26*; G01C *21/06*; G05B *1/00*

U.S. Cl. 356—152 **5 Claims**



1. A retro-reflective electro-optical angle measuring system comprising in combination:

transmitting means for generating a first laser beam;

a beamsplitter for developing two angularly divergent sub-beams from said first laser beam;

a mirror system;

individual sub-beam associated photomultipliers;

a vibrating mirror disposed in the path of said sub-beams for sweeping said sub-beams across a retro-reflective tape and for re-directing the retro-reflected sub-beams back through said mirror system and upon said respective individual sub-beam associated photomultipliers, said photomultipliers responsive to said sub-beams for providing photomultiplier pulses when said sub-beams cross said retro-reflective tape; and,

receiving means responsive to the time interval between said photomultiplier pulses for angle measurement between said retro-reflective tape and a reference plane formed by said sweeping sub-beams, the sign of the angle dependent upon the sequence of said sub-beams crossing said retro-reflective tape.

4,443,104

FLUORIMETER SAMPLING APPARATUS

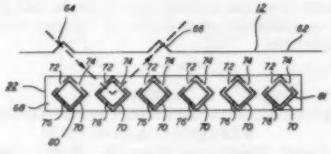
Ingó Ringhardtz, Uberlingen, Fed. Rep. of Germany, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 21, 1982, Ser. No. 341,386

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1981, 3108474

Int. Cl.³ G01N *1/10*

U.S. Cl. 356—246 **4 Claims**



1. A fluorimeter sampling apparatus comprising:

a sample housing;

a movable carrier positioned within said sample housing, said carrier being adapted to move linearly along guiding means therein;

a support plate having means for retaining a cuvette holder, said support plate being releasably attached to said carrier, said cuvette holder having a plurality of generally rectangularly-shaped cuvette receptacles extending therefrom, said receptacles being arranged diagonally with respect to the direction of linear movement of said carrier, each said receptacle having an entrance aperture adapted to accept and pass therethrough excitation radiation and an exit aperture adapted to pass fluorescence radiation therethrough, said entrance and exit apertures being positioned on adjacent sides of each said receptacle.

4,443,105

DEVICE USEFUL FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY

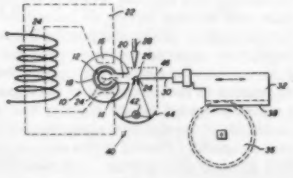
Bernhard Huber, Uberlingen; Rolf Tamm, Salem, and Toma Tomoff, Uberlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Oct. 9, 1981, Ser. No. 310,190

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044627

Int. Cl.³ G01N *21/74*

U.S. Cl. 356—312 **11 Claims**



1. Apparatus useful for flameless atomic absorption spectroscopy; said apparatus comprising:

a sample carrier adapted to be inserted into a graphite tube and being configured to accept non-gaseous sample material;

means, external to said graphite tube, for radiantly heating said sample carrier;

an elongated sample carrier holder, said sample carrier being supported by one end of said sample carrier holder, said holder being a temperature sensor;

a carriage, said carriage having the other end of said holder secured thereto, said carriage being guided along a straight path longitudinally of said holder and being moveable between a first position, whereat said sample carrier is in the area of said heating means, and a second position, whereat said holder with said sample carrier extends into the interior of said graphite tube through said aperture; and

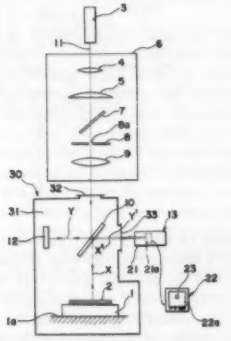
a drive motor coupled to said carriage, said carriage, with said holder and said sample carrier, being arranged to be controllably moved by said motor toward an introduction aperture of said graphite tube.

4,443,106

MEASURING DEVICE FOR MEASURING THE AMOUNT OF CHANGE IN THICKNESS OF THE PAINT LAYER

Zenichi Yasuda, Nishinomiya; Misao Morita, Kobe, and Takashi Nakajima, Nishinomiya, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Dec. 1, 1981, Ser. No. 326,675
Claims priority, application Japan, Aug. 22, 1981, 56-131921
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—357 **11 Claims**



1. A measuring device for measuring a change in time-dependent thickness of a paint layer, comprising:

a light source for emitting a coherent light;

a means for collimating the light emitted from said light source along an optical axis and removing noise components thereof;

a first chamber having a support means therein for the support of a test piece painted on one surface thereof with a paint layer to be tested;

a control means for controlling the atmosphere in said first chamber to cause the paint layer to dry under a predetermined condition;

a reflective mirror supported in said first chamber; a semi-transparent mirror disposed in said first chamber and inclined to the optical axis of said collimating means for splitting the collimated light into first and second light beams, the first light beam being directed perpendicularly to the paint layer and the second light beam being directed perpendicularly to said reflective mirror;

a receiver for receiving the first and second light beams after having been reflected from the paint layer and said reflective mirror, respectively, and then having been joined together by said semitransparent mirror, said receiver upon receipt of the first and second light beams forming thereon interference fringes resulting from the interference between the first and second light beams; and

a means for measuring the amount of movement of the interference fringes;

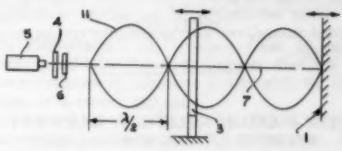
whereby change in thickness of the paint layer with time is indicated by the amount of movement of the interference fringes measured.

4,443,107

OPTICAL DISPLACEMENT SENSOR

David H. Alexander, 19406 Hinsdale Ave., Torrance, Calif. 90503; Kachu Ishizuka, 29237 Whitley Collins Dr., Rancho Palos Verdes, Calif. 90274, and Robert N. Sato, 50 Montemalaga Plz., Palos Verdes Estates, Calif. 90274

Filed Aug. 3, 1981, Ser. No. 289,255
Int. Cl.³ G01B *11/14*; G01C *3/08*
U.S. Cl. 356—373 **6 Claims**



1. A device for accurately measuring relative linear displacement between two elements comprising:

a standing wave light pattern produced by the impingement of a single monochromatic light beam on a reflector,

a transparent photosensitive detector provided in the standing wave pattern movable relative to said reflector and capable of detecting the crests and nodes of said standing wave intercepted by said detector, said transparent photosensitive detector comprising two parallel photosensitive detectors each normal to the longitudinal axis of said standing wave and separated from each other by a finite distance along said light beam,

counting means capable of determining the number of crests and/or nodes of said standing wave pattern passing through said photosensitive detector, and

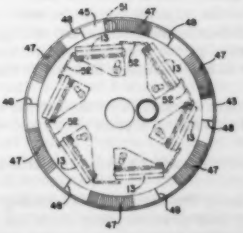
direction sensing means determining the direction and relative movement between said photosensitive detector and said reflector, said direction sensing means comprising circuit means for comparing the electrical current output of each of said parallel photosensitive detectors.

4,443,108

OPTICAL ANALYZING INSTRUMENT WITH EQUAL WAVELENGTH INCREMENT INDEXING

Donald R. Webster, Laurel, Md., assignor to Pacific Scientific Instruments Company, Anaheim, Calif.

Filed Mar. 30, 1981, Ser. No. 248,729
Int. Cl.³ G01J *3/50*
U.S. Cl. 356—418 **8 Claims**



1. An optical analyzing instrument comprising means to

generate a wide wavelength band beam of light, rotatable means including a filter and operating to rotate said filter through said beam of light continuously changing the angle of incidence of said filter to said beam of light as it rotates through said beam, said filter transmitting a narrow wavelength band of light and scanning the center frequency of the transmitted narrow wavelength band of light as the filter changes the angle of incidence with respect to said beam of light, means defining an annular track having linearly distributed marks in said track, transducer means having a sensing position to sense said marks passing through said sensing position and produce a pulse as each mark passes through said sensing position, means to impart relative rotation between said track and said transducer means in synchronism with the rotation of said filter to cause said marks to pass through said sensing position, said marks being unequally spaced in said track with the unequal spacing selected so that said transducer means generates one pulse for each equal increment of change of the center wavelength of the narrow wavelength band transmitted through said filter as said filter rotates through said beam of light.

4,443,109

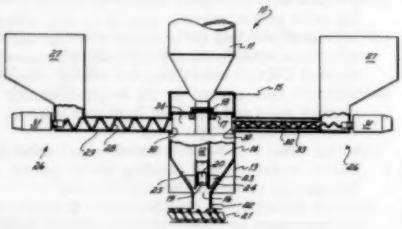
METHOD AND APPARATUS FOR CONTINUOUS FEEDING, MIXING AND BLENDING

Robert H. Watts, North Bend, Ohio, assignor to Vol-Pro Systems, Inc., Centerville, Ohio

Filed Sep. 21, 1981, Ser. No. 303,874

Int. Cl.³ B01F *15/04*

U.S. Cl. 366—134 **45 Claims**



1. An apparatus for mixing and blending solid particulate materials, comprising:

a mixing and blending chamber, said chamber having a downwardly sloping bottom wall,

a port at the lower end of said bottom wall,

a vertical flow tube having an upper and lower end, said tube having a vertical axis,

support means for rotatably supporting said tube for rotation about said axis within said chamber,

agitating means mounted on said tube for agitating materials in said chamber,

drive means to rotate said tube about said vertical axis,

an opening in said tube at its lower end,

deflecting means adjacent the lower end of said tube for radially deflecting material toward said agitating means,

a first source of primary feed material communicating with said tube to admit primary material to said chamber for mixing,

a second source of secondary feed material communicating with said chamber at a point above said opening in said tube,

means for metering said secondary material into said chamber,

discharge means for receiving and feeding said first and secondary feed materials away from said chamber, said discharge means being below said port,

whereby said primary material flowing through said rotating tube and said secondary material being metered into said chamber are mixed together within said chamber prior to flowing through said port to said discharge means.

4,443,110

METHOD FOR MIXING AND MASTICATING HIGHLY VISCOUS MATERIALS

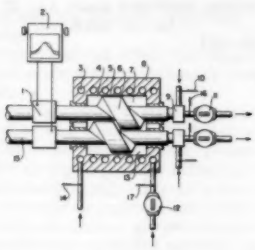
Johan L. den Otter, Leidschendam, Netherlands, assignor to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Jan. 18, 1982, Ser. No. 340,326

Claims priority, application Netherlands, Jan. 20, 1981, 8100247

Int. Cl.³ B01F *15/06*; B29B *1/06*; B28C *1/16*

U.S. Cl. 366—97 **3 Claims**

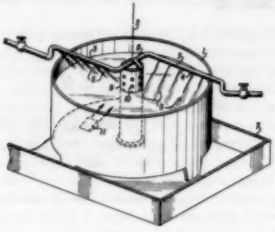


1. A method of mixing highly viscous materials in a mixer consisting of a mixing chamber with at least one rotor rotably mounted within the chamber and driven by a drive, the container wall being provided with cooling means through which a coolant flows, comprising measuring the torque of the rotor, counting the number of revolutions of the rotor, measuring the temperature of the materials being mixed, measuring the temperature of the wall of the chamber, measuring the amount of coolant flow through the cooling means, measuring the temperature rise of the coolant, determining during a period of time with a constant velocity of rotation of the at least one rotor, at least two of the three quantities: supplied energy (SE), utilized energy (UE), and slip energy (SIE), the SE being calculated from the product of the measured torque exercised on the at least one rotor and the counted number of revolutions of the rotor, the UE being the sum of the energy accumulated in the viscous material calculated from the product of the measured temperature rise, the weight and specific heat of this material, the energy removed from the viscous material through the wall calculated from the product of the coefficient of heat transfer from the material to the wall, the measured temperature differences between the material and the wall, and the wall area in contact with the material, and the SIE being the difference between the energy removed from the wall calculated from the product of the amount of coolant used for cooling the wall and the average rise of the temperature of this coolant during cooling, and the energy removed from the viscous material through the wall, calculating the value of the ratio of UE/SE possibly by using the formula SE=UE+SIE, repeating the above procedure for different values of the velocity of rotation, determining the value of the velocity of rotation for which the ratio E/SE has a maximum value and maintaining that velocity at that value.

4,443,111
INSTALLATION FOR WASHING VEGETABLES, FRUITS OR SIMILAR PRODUCTS

André Minaire, 44, rue de Margnolles, 69300 Caluire, France

Filed Jun. 14, 1982, Ser. No. 388,268
Claims priority, application France, Jun. 23, 1981, 81 12567
Int. Cl.³ B01F *15/02*
U.S. Cl. 366—165 9 Claims



1. Apparatus for washing vegetables, fruits or similar products, comprising:

a cylindrical tank,

a source of supply for filling the tank with wash water and driving the resultant mass of water in rotation around the vertical axis of the tank,

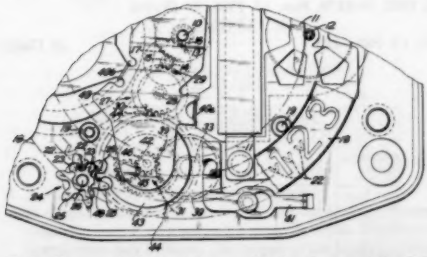
discharge orifices in the tank for maintaining the amount of water constant and driving impurities towards the outside,

wherein the source of supply comprises at least one ramp arranged above the level of the water contained in the tank and provided with holes along the ramp from the periphery to the center of said tank, with said holes being oppositely directed on each side of the center of said tank, said holes being oriented diagonally downward so that jets emerging therefrom strike the surface of water in the tank and drive substantially all of the water in a movement of rotation which assures washing of the products contained within the tank, thus driving impurities towards the outside by the discharge of water through orifices provided for this purpose.

4,443,112
PLANETARY GEAR FOR DATE MECHANISM IN A WRISTWATCH

Gerhard Stotz, Pforzheim; Adolf Sedlak, Wurmberg, both of Fed. Rep. of Germany, and Jean-Pierre Skwarek, Besancon, France, assignors to Timex Corporation, Waterbury, Conn.

Filed Sep. 29, 1982, Ser. No. 427,055
Int. Cl.³ G04B *19/24*
U.S. Cl. 368—37 10 Claims



1. An improved date setting mechanism in a watch of the type having a normal timekeeping gear train for driving watch hands from a motor, and also having a supplementary gear train for periodically advancing a date ring, wherein said improvement comprises:

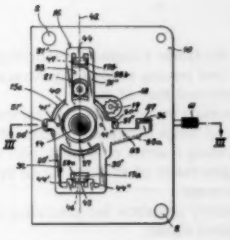
a planetary gear assembly making up a portion of the supplementary gear train, having a first gear, a coaxial second gear, a planet carrier coaxial with said first and second gears, said carrier having teeth driven as part of said supplementary gear train, and at least one planet gear rotatably mounted in the carrier member and meshing with the first and second gears, the second gear adapted to periodically advance means driving the date ring, and

a manually rotatable date button accessible from the outside of the watch and coupled to drive the first gear, whereby the first gear may drive the second gear through the planet gear to advance or retard the date ring without disturbing the normal date advancing function.

4,443,113
ELECTROMECHANICAL TRIGGER FOR ALARM CLOCKS AND OTHER TIMER-OPERATED SIGNAL EMITTERS

Wolfgang Fehrenbacher, St. Georgen; Hans Heinzelmann, Schramberg, and Erich Scheer, St. Georgen, all of Fed. Rep. of Germany, assignors to Kieninger & Obergfell, St. Georgen, Fed. Rep. of Germany

Filed Apr. 27, 1981, Ser. No. 257,854
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3015982
Int. Cl.³ G04B *23/02*
U.S. Cl. 368—72 16 Claims



5. In a timer-operated signal emitter comprising a clockwork, a presettable control member coaxially juxtaposed with a coacting member of said clockwork, said members being provided with mating formations alignable with each other for interengagement in a predetermined relative angular position thereof, normally inactive signal-generating means, a trigger mechanism for activating said signal-generating means, said trigger mechanism including biasing means on a mounting plate perpendicular to the axis of said members bearing upon said control member for axially shifting same toward said coacting member in said predetermined position and switch means responsive to such an axial shift for closing an operating circuit of said signal-generating means, and blocking means for terminating or inhibiting closure of said operating circuit,

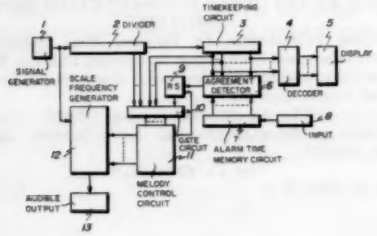
the improvement wherein said biasing means comprises a leaf spring having an intermediate part between two extremities that are pivoted on said mounting plate with limited swingability about a centerline parallel to said mounting plate and perpendicular to said axis, said leaf spring having a first and a second tongue symmetrically disposed on opposite sides of said centerline, said switch means including a first contact element on said first tongue and a second contact element on said second tongue respectively confronting a third and a fourth contact element on said mounting plate for simultaneous engagement therewith upon a substantially axial motion of the intermediate part of said leaf spring toward said mounting plate, said blocking means comprising an interrupter interposable in the path of a lateral extension of said leaf spring

adjacent said first tongue for causing said leaf spring to rock about said centerline upon mutual alignment of said formations and keeping said first and third contact elements apart.

4,443,114
ELECTRONIC TIMEPIECE WITH MELODY ALARM FACULTIES

Kiyoshi Kumata, Tsuzuki, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 174,511, Aug. 1, 1980, abandoned, which is a continuation of Ser. No. 2,218, Jan. 9, 1979, abandoned. This application Aug. 9, 1982, Ser. No. 406,577
Claims priority, application Japan, Jan. 17, 1978, 53-4076; Mar. 2, 1978, 53-24267
Int. Cl.³ G04B *23/02, 21/00*
U.S. Cl. 368—73 **11 Claims**



1. An electronic timepiece comprising:

alarm time sensing means for generating an alarm signal at a preselected time of day;

tune storage means for storing information indicative of a desired series of musical notes, said tune storage means providing a series of musical note signals in response to the generation of an alarm signal by said alarm time sensing means;

a frequency generator for generating a high frequency time standard signal;

a frequency divider connected to said frequency generator, said frequency divider including a fixed division rate divider including N stages, each of said stages having an output, said divider having a reset terminal;

means for combining the outputs of said divider in a selected manner to produce a signal having a desired frequency representative of a desired musical note;

means for selecting the manner in which the outputs of said divider are to be combined in order to select one of a plurality of desired frequencies, each corresponding to each desired musical note and its associated musical note signal produced by said tune storage means, said means for selecting including,

an M row × N column switch array, the N columns of said array being driven by said divider stage outputs, the M rows of said array being connected through a note enabling circuit to the reset terminal of said divider, the switches of said array being selectively enabled to produce a count at said reset terminal corresponding to the division ratio necessary to produce said desired frequency corresponding to that row, and

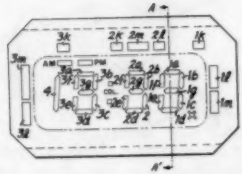
note selection means responsive to said musical note signals and controlling said note enabling circuit for enabling at least one row of said array to thereby select said desired frequency; and

an audio generator for generating an audible musical note upon application of each desired frequency from said divider, said audio generator producing a musical tune by the successive generation of said desired series of musical notes.

4,443,115
ELECTRONIC TIMEPIECE WITH ELECTROCHROMIC DISPLAY

Noboru Kaneko, and Junichi Tabata, both of Tokyo, Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Jan. 2, 1981, Ser. No. 221,979
Claims priority, application Japan, Jan. 14, 1980, 55-2721
Int. Cl.³ G04C *19/00;* **G09F** *9/00;* **G02F** *1/17*
U.S. Cl. 368—82 **16 Claims**

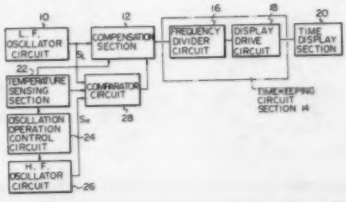


1. In an electronic timepiece operable in at least a normal display mode for keeping and displaying time information: an electrochromic display device comprising display segments having colored and bleached states for displaying time information, and dummy segments having colored and bleached states and which are not used for the display of time information but to which, when the device is driven, electric charges are transferred, the areas of the dummy segments being so chosen in relation to those of the display elements that, when the total colored area of the display segments is changed to change the time information displayed, the total area of segments including both the dummy segments and the display segments remains substantially constant and the coloration density of the display remains substantially unchanged; circuit means for periodically setting an electric charge transfer time during which electric charge transfer occurs between selected segments and a memory time during which the segments retain their colored or bleached states; means for selectively applying negative voltage to segments which are selected to change from the bleached state at a time t_{n-1} to the colored state at another time t_n; and means for selectively applying a positive voltage to segments which are selected to change from the colored state at a time t_{n-1} to the bleached state at a time t_n, no voltage being applied to segments which are not required to change from the colored state to the bleached state during the electric charge transfer time.

4,443,116
ELECTRONIC TIMEPIECE

Makoto Yoshida; Shinichi Watanabe, and Fuminori Suzuki, all of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,222
Claims priority, application Japan, Jan. 9, 1981, 56-1859; Jan. 23, 1981, 56-9179; Nov. 13, 1981, 56-181866
Int. Cl.³ G04B *17/20*
U.S. Cl. 368—202 **20 Claims**



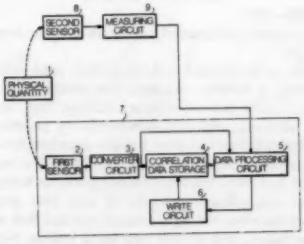
1. An electronic timepiece comprising:

a low frequency oscillator circuit controlled by a first quartz crystal vibrator, for producing a time base signal;
frequency divider circuit means for performing frequency division of said timebase signal to produce a unit time signal;
time display means responsive to said unit time signal for displaying time information;
a high frequency oscillator circuit controlled by a second quartz crystal vibrator for producing a high frequency signal;
temperature sensing means for producing a temperature data signal indicative of a current operating temperature of said electronic timepiece, said temperature sensing means including means for producing a specific temperature condition signal for indicating that said operating temperature is within a predetermined specific temperature range;
comparator means for comparing the frequencies of said high frequency signal and said timebase signal, to detect an error in the frequency of said unit time signal by measuring deviations of said timebase signal from a predetermined standard value thereof, said standard value having a predetermined relationship to the frequency of said high frequency signal, and for producing output signals indicative of said timebase signal frequency deviation, said comparator means being controlled by said specific temperature condition signal from said temperature sensing means for performing said frequency comparison only when said operating temperature is within said specific temperature range;
temperature compensation means responsive to said temperature data signals from said temperature sensing means for compensating said unit time signal frequency for a deviation therein resulting from the effects of temperature variation upon said first quartz crystal vibrator; and
aging compensation means responsive to said output signals from said comparator means for compensating said unit time signal frequency for variations therein resulting from aging of said first quartz crystal vibrator.

4,443,117
MEASURING APPARATUS, METHOD OF MANUFACTURE THEREOF, AND METHOD OF WRITING DATA INTO SAME

Yutaka Muramoto; Susumu Kobayashi, and Hideo Ishizaka, all of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 302,824
Claims priority, application Japan, Sep. 26, 1980, 55-134103; Jan. 12, 1981, 56-2784
Int. Cl.³ G01K *7/16*
U.S. Cl. 374—1 **23 Claims**

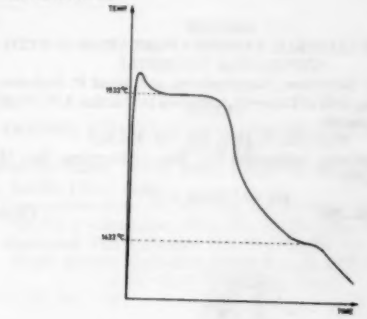


1. A measuring apparatus which comprises:
data output means for delivering, to the outside of the apparatus, an output of a sensing system in order to generate correlation data between the output of the sensing system and a sensor output representative of a standard physical quantity;
substantially non-volatile storage means;
data input means for retaining the generated correlation data, wherein address-and-data sets generated on the basis of two different outputs of the sensing system are stored in said substantially non-volatile storage means; and
a supporting base for unitarily supporting the sensing system, said data output means, said storage means and said data input means;
the correlation data retained in said substantially non-volatile storage means being read out of said storage means at the time of measurement, wherein the output of the sensing system serves to address said storage means to obtain an output which corresponds to a physical quantity sensed by the sensing system.

4,443,118
METHOD OF DETERMINING THE CARBON CONTENT OF STEEL MELTS BY THERMAL ANALYSIS

Omer P. I. Cure, Diepenbeek, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Apr. 9, 1981, Ser. No. 252,694
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1980, 3013621
Int. Cl.³ G01N *25/02*
U.S. Cl. 374—26 **4 Claims**



1. A method of determining the percentage of carbon in a sample of molten steel by thermal analysis comprising the steps of:
(a) allowing a sample of molten steel to cool from the liquid phase to the austenite phase,
(b) determining the temperature of the sample at the liquidus phase change,
(c) determining the temperature of the sample at the austenite phase transformation,
(d) comparing said temperatures and ascertaining ΔT,
(e) using ΔT to ascertain the percent carbon in said sample.

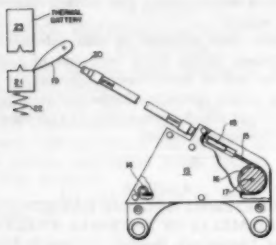
4,443,119
ROLLER BEARING HOT BOX SENSOR

Hugh H. Snider, Jr., Silver Spring, and Richard A. Marion, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1982, Ser. No. 375,141
Int. Cl.³ G01K *13/08*
U.S. Cl. 374—153 **10 Claims**

1. A roller bearing, hot box temperature sensor designed to be mounted in a train with wheels, where the sensor functions to control and stop the train in response to temperature changes sensed in the wheel bearing assembly comprising a housing for mounting a temperature sensor in close proximity to a train wheel bearing assembly with an opening within said housing combined with metallic means capable of contracting in response to rapid increases in temperature and where one end of the metallic sensing means is permanently fixed on one

end to the wheel bearing assembly and the opposite end of the metallic means is attached to a mechanical control means that is actuated by contraction of the said metallic means and where



the contraction of the metallic means functions, through the mechanical control means to stop the train wheels when a certain temperature is reached.

4,443,120

REMOTE CONTROL TEMPERATURE SENSOR WITH EXPANSIBLE MATERIAL

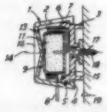
Niels P. G. Graversen, Augustenborg, and Svend P. Pedersen, Nordborg, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

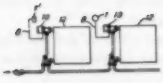
Filed Jan. 4, 1982, Ser. No. 336,963

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1981, 3102311

Int. Cl.³ G01K *5/10*

U.S. Cl. 374—201 **1 Claim**





1. A remote control temperature sensor for operating a temperature regulating valve, comprising, a housing having an outlet aperture, a cylindrically shaped capsule mounted in said housing containing a temperature responsive expansible material, a flexible capillary tubing, of length frequently in excess of the distance between said valve and said capsule, communicating with said capsule; said capsule having therearound at least some of the excess length of said tubing wound into a coil about said capsule when it is used to sense temperature in the vicinity of said capsule at said distance remote from said valve, said tubing being let out of said sensor housing through said outlet aperture, said capsule being mounted in the sensor housing about an axis coincident with the axis of said coil, said housing including a detachable cap having an outlet slot for said tubing.

4,443,121

THERMAL PRINTING APPARATUS WITH REFERENCE GRAY SCALE COMPARATOR

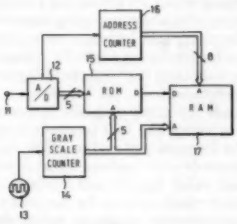
Kiyoshi Arai, Higashikurume, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 1, 1983, Ser. No. 470,964

Claims priority, application Japan, Mar. 2, 1982, 57-31709

Int. Cl.³ B41J *3/02*; G01D *15/10*; H04N *7/12*

U.S. Cl. 400—120 **16 Claims**



1. An apparatus for printing a gray scale image using a thermal printing head driven by digital data representing a plurality of image elements of the image to be printed, the apparatus comprising:

reference generator means for generating digital reference gray scale level signals;

first memory means containing known data stored therein for producing a corresponding output when addressed by said reference gray scale level signals and said digital data;

second memory means for storing said output from said first memory means at addresses determined by signals produced by an address counter and by said reference gray scale level signals, said stored output representing pulse width modulated digital data; and

output means connected to an output of said second memory means for supplying drive pulses to heat elements of said thermal printing head corresponding to said pulse width modulated digital data stored in said second memory means.

4,443,122

DOT MATRIX PRINT HEAD

James E. Blomquist, and Robert H. Wilczewski, both of 203 E. Main, Riverton, Wyo. 82501

Continuation-in-part of Ser. No. 256,032, Apr. 21, 1981, which is a division of Ser. No. 38,724, May 14, 1979, Pat. No. 4,279,518. This application Sep. 14, 1981, Ser. No. 301,641

Int. Cl.³ B41J *3/12*

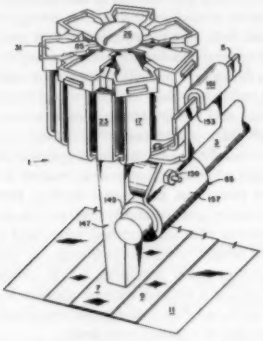
U.S. Cl. 400—124 **20 Claims**

1. In a dot matrix print head having an axis, the improvement comprising:

a plurality of individual coil assemblies, each coil assembly including a bobbin member, coil member, and clapper member, said bobbin member having first, second, and third portions, said coil member being positioned about said first portion and said bobbin member having means for retaining said coil member about said first portion, said second and third bobbin member portions being attached to and extending outwardly of said first portion, said clapper member having a central axis and first and second end portions, said second and third bobbin member portions having means for mounting said clapper member therebetween for movement relative to said bobbin member between at least first and second positions with said first end portion mounted adjacent said second bobbin member portion and said second end portion mounted adjacent said third bobbin member portion, said clapper member mounting means of said second and third bobbin member portions including means for maintaining the central axis of said clapper member in a predetermined

plane relative to said bobbin member as said clapper member moves between said first and second positions,

said clapper member mounting means of each bobbin member including at least one generally L-shaped member attached to and integral with said bobbin member and having a first leg thereof extending from said bobbin member generally parallel to the axis of said print head and a second leg thereof extending generally perpendicular to said axis and radially outwardly thereof from said first leg, said first and second legs forming an included angle therebetween, and,



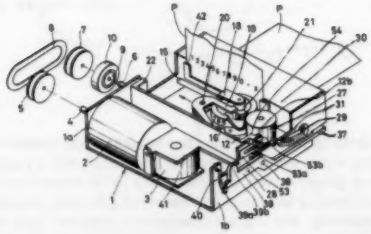
said dot matrix print head further including at least a first, endless O-ring selectively positionable at the same time within the included angle of each of said L-shaped member wherein said first O-ring in the assembled dot matrix print head forms a common member to each of said coil assemblies, said common, first O-ring being positioned within the included angle of each of said L-shaped members and said first O-ring further extending between adjacent coil assemblies of the dot matrix print head and about the axis thereof.

4,443,123

SMALL SERIAL PRINTER

Keikichi Ono, Chichibu, and Hirofumi Hirano, Saitama, both of Japan, assignors to Canon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,863
Claims priority, application Japan, Jul. 7, 1981, 56-104966
Int. Cl.³ B41J *1/20, 1/34*
U.S. Cl. 400—145.2 **3 Claims**



1. A small serial printer comprising:

a type drum adapted to rotate about an axis perpendicular to the direction of a line of print on a printing paper, said type drum including a hollow cylindrical base member and at least two elastic type belts disposed around said base member at different levels on the circumference of said base member, each type belt having a plurality of types arranged on the surface of the type belt;

a carriage for carrying said type drum in the direction of the line of print; and

a hammer rotatably supported about an axis having a first end which leads into the interior of said type drum and is disposed opposite to the backside of the types of said type belts, and having a second end outside of said type drum and disposed to contact a cam member to rotate said hammer during movement of said carriage, wherein the first end of the hammer strikes the backside of one type of one type belt so that the type is pushed out against the printing paper to effect printing,

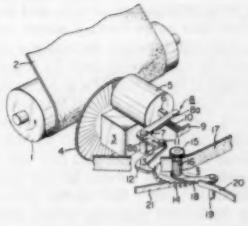
wherein said carriage has a driving gear which engages a drum gear and said printer has a clutch gear provided on a frame side of said printer to mesh with said driving gear when said carriage comes to a determined position, said clutch gear being interlocked with a paper feed worm gear through a spring clutch, so that the printing paper is fed by rotating a paper feed roller through a paper feed gear in mesh with said worm gear and said spring clutch is controlled through a lever which engages said carriage.

4,443,124

PRINTER WITH ELECTROMAGNETICALLY DRIVEN HAMMER

Toshiaki Ozawa, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 330,721, Dec. 14, 1981, abandoned, which is a continuation of Ser. No. 104,844, Dec. 28, 1979, abandoned. This application Jul. 15, 1983, Ser. No. 513,784
Claims priority, application Japan, Dec. 23, 1978, 53-161467
Int. Cl.³ B41J *9/38, 33/26, 33/32*
U.S. Cl. 400—185 **8 Claims**



1. A printer, comprising:

a lever arrangement for feeding an ink ribbon;

means connected to said lever arrangement for driving said lever arrangement to feed the ink ribbon, said means including a magnet, a coil associated with said magnet and adapted to receive electric voltage from a voltage source, and a reciprocating member operable by said magnet and said coil when said coil receives voltage, wherein one end of said member operates as a hammer to hit a type to effect a print on a recording medium with the ink ribbon when said member is moved in a print direction, and the other end thereof effects a driving operation of the ink ribbon by said lever arrangement when said member is moved in the opposite direction; and

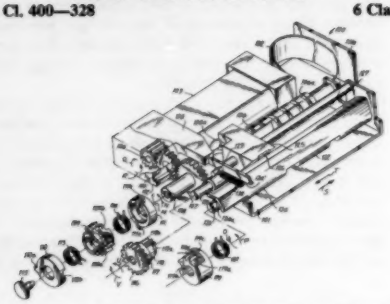
a spring connected to said lever arrangement for retaining said member in a predetermined position when electric voltage is not applied to said coil.

4,443,125

PRINTER

Seiichi Hirano, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Dec. 24, 1981, Ser. No. 334,398
Claims priority, application Japan, Dec. 27, 1980, 55-188441; Dec. 30, 1980, 55-188170; Sep. 30, 1981, 56-155206
Int. Cl.³ B41J *3/20, 19/14, 9/20*
U.S. Cl. 400—328 6 Claims



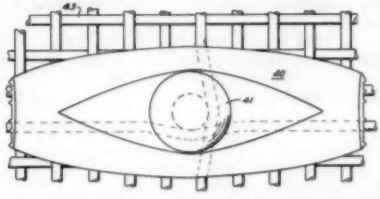
1. A thermal printer having a printing head which serially prints characters across lines on a thermosensitive recording medium comprising a frame, a driving shaft rotatably supported on said frame and drive means for selectively rotating said driving shaft by any amount in first and second directions, said driving shaft being operatively coupled to said printing head to laterally reciprocate said printing head across said thermosensitive medium as said drive means rotates said driving shaft, paper feeding means supported on said frame for selectively advancing said thermosensitive medium past said printing head, a platen supported on said frame and platen release means for selectively pressing said platen to said printing head, said thermosensitive medium extending intermediate said platen and said printing head, clutch means driven by said driving shaft and operatively coupled to said paper feeding means and said platen releasing means for selectively operating said paper feeding means and said platen releasing means, said clutch means being selectively rotated in said first and second directions by a predetermined amount by said driving shaft to selectively operate said paper feeding means and said platen release means, said clutch means including a toothed wheel rotatably disposed on said driving shaft for rotation through a predetermined angle in either said first and second directions as said driving shaft rotates in one of said first and second directions, respectively, coupling means for selectively coupling said toothed wheel to said driving shaft for rotation through said predetermined angle in either said first and second directions as said driving shaft is rotated in said first and second directions, respectively, and a first ratchet rotatably disposed on said driving shaft, said coupling means including a first spring clutch having two ends disposed on said driving shaft, a first end of said spring clutch being coupled to said toothed wheel and the second end of said spring clutch being coupled to said first ratchet, said first spring clutch rotating said toothed wheel and said first ratchet through said predetermined angle in said first direction when said driving shaft is rotated in said first direction, said toothed wheel and said first ratchet not being substantially rotated in said second direction by said first spring clutch as said driving shaft is rotated in said direction, said first ratchet including a first pawl, said frame having a stopping portion which said first pawl contacts after said first ratchet moves through said predetermined angle in said first direction to stop the rotation of said first ratchet, the stopping of rotation of said first ratchet acting through said spring clutch to stop the rotation of said toothed wheel, said clutch means further including a second ratchet rotatably disposed on said driving shaft, said coupling means further including a second spring clutch having two ends disposed on said driving shaft, a first end of said second spring clutch being coupled to said toothed wheel and the second end of said second spring clutch being coupled to said second ratchet, said second spring clutch rotating said toothed wheel and said second ratchet through said predetermined angle in said second direction when said driving shaft is rotated in said second direction, said toothed wheel and said second ratchet not being substantially rotated in said first direction by said second spring clutch as said driving shaft is rotated in said first direction, said second ratchet including a second pawl, said second pawl contacting said stopping portion on said frame after said second ratchet moves through said predetermined angle in said second direction to stop the rotation of said second ratchet, the stopping of rotation of said second ratchet acting through said second spring clutch to stop the rotation of said toothed wheel, said paper feeding means including a shaft rotatably supported on said frame, a first gear rotatably disposed on said shaft, said first gear being rotated by said toothed wheel in said first and second directions, and a third spring clutch having two ends disposed on said shaft, a first end of said third spring clutch being coupled to said first gear, said third spring clutch causing said shaft to rotate when said first gear is rotated in one of said first and second directions, said paper feeding means further including an operation gear rotatably disposed on said frame in meshing engagement with said toothed wheel and an intermittent gear secured to said operation gear engaged with said first gear, said intermittent gear including a first locking portion, said first gear having a second locking portion which selectively engages with said first locking portion of said intermittent gear to stop the rotation of said shaft.

4,443,126

WATER SCREENING CLAMP STRIP

Donald A. Strow, Hales Corners, and Harold I. G. Henning, New Berlin, both of Wis., assignors to Envirex Inc., Waukesha, Wis.

Continuation of Ser. No. 95,850, Nov. 19, 1979, abandoned. This application Jun. 25, 1981, Ser. No. 277,304
Int. Cl.³ F16D *1/00*
U.S. Cl. 403—24 4 Claims



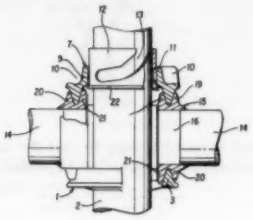
1. A clamping strip for bolting to a straight frame member of a traveling water screen and securing therebetween a margin of a heavy gauge woven wire screening to be carried by the frame, comprising an elongated element of a durable, non-corrosive relatively less rigid thermoplastic material than the screen, the strip element being generally rectangular in cross-section and having a bolt, the strip element having a screen engaging face that is arcuately formed to present longitudinal outer edges to the screen proportioned such that the strip is strained by bolt tension and deforms the outer edges of said element into the intersticies between the wires of the screening to interlock the screening with the strip and to firmly secure the screening to the frame.

4,443,127

COUPLING

Petrus J. L. de Leeuw, B.V. Heesselstraat 5, Aarle-Rixtel, Netherlands

Filed Oct. 29, 1981, Ser. No. 316,275
Claims priority, application Netherlands, Oct. 30, 1980, 8005954
Int. Cl.³ F16D *1/00, 3/00;* F16L *41/00*
U.S. Cl. 403—175 15 Claims



1. A coupling for intercoupling at least two substantially orthogonal bars or tubes comprising:

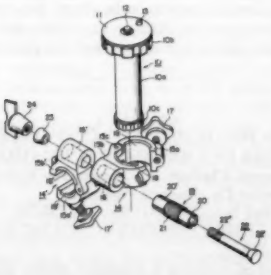
an annular member surrounding one said bar or tube and rigidly fastened thereto, a loose, annular member positioned on said one bar or tube, and a link fastened to one end of each said other said bar or tube and positionable between said annular members, wherein the end of each said link has recesses and protruding noses and wherein the annular members are provided with protruding noses fitting in the recesses of said links and wherein the loose, annular member is provided on the radially inner side thereof with a plurality of lugs evenly distributed along the radially inner periphery of said loose annular member, and wherein said one bar or tube has guide surfaces cooperating with said lugs which clamp said loose annular member, said guide surfaces having a portion at an acute angle to a plane at right angles to said tube.

4,443,128

FIXING DEVICE HAVING TWO PIVOTALLY INTERCONNECTED CLAMPS

Toshiharu Yamamoto, Yokohama, and Koichiro Nakatani, Tokyo, both of Japan, assignors to Victor Company of Japan, Limited, Yokohama and Nihon Velbon Seiki Kogyo Kabushiki Kaisha, Tokyo, both of, Japan

Filed Jul. 10, 1981, Ser. No. 282,171
Claims priority, application Japan, Jul. 11, 1980, 55-96981[U]
Int. Cl.³ B25G *3/36;* E04G *7/00*
U.S. Cl. 403—385 5 Claims



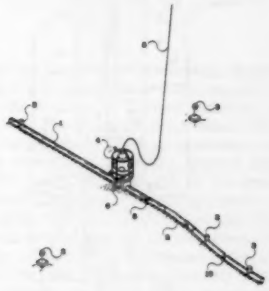
1. The device of claim 5, wherein said coupling means includes a tubular member received in said aligned throughbores and having a circumferentially segmented portion at opposite ends thereof, said tightening means including a bolt-and-nut arrangement extending through said tubular member and said tapered surface of each said pair of members engaging and spreading the segments of said segmented portions apart and pressing the segments against the inner walls of said throughbores when said bolt-and-nut arrangement is tightened.

4,443,129

METHOD AND APPARATUS FOR TAPPING A SUBMERGED PIPE

Bruno de Sivry; Jean-Louis Migliarese-Caputi, both of Paris; Guy Hervé, and Claude Colas, both of Nantes, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Aug. 20, 1981, Ser. No. 294,641
Claims priority, application France, Aug. 22, 1980, 80 18328
Int. Cl.³ F16L *1/00*
U.S. Cl. 405—170 25 Claims



1. A process for tapping a region of a submerged pipe, comprising the steps of:

engaging a portion of a submerged pipe by at least one lifting device;

displacing said pipe portion in vertical and horizontal directions using said lifting device;

installing a working platform above a tapping region of said pipe;

attaching a modular tool-carrier to a support girder;

lowering said support girder having said modular tool-carrier attached thereto onto said working platform;

conducting an operation on said pipe portion using said modular tool-carrier, said operation being one of a plurality of operations consisting of stripping concrete from said pipe portion, stripping an anti-corrosion covering from said pipe portion, making a final cut in said pipe portion, fettling said final cut, internally brushing said pipe portion over a predetermined length, and making a longitudinal weld of said pipe portion flush;

raising said support girder to a water surface;

removing said modular tool-carrier from said support girder;

placing an additional modular tool-carrier on said support girder and again lowering said support girder having said additional modular tool-carrier onto said working platform if an additional operation is to be conducted;

repeating said raising, removing, placing, and again lowering steps until all desired operations have been completed.

4,443,130

REMOTELY OPERATED TOOL FOR PERFORMING FUNCTIONS UNDER WATER

Douglas D. Hall, Houston, Tex., assignor to Armco Inc., Middletown, Ohio

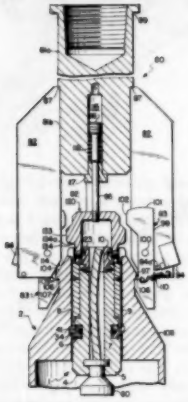
Filed Dec. 14, 1981, Ser. No. 330,671
Int. Cl.³ B63C *11/52;* E21B *23/04*
U.S. Cl. 405—190 18 Claims

1. In a remotely operated handling tool for retrieving and

installing an underwater device which is releasably latched in a hollow member when installed under water, the combination of

a tool body attachable to a handling string and having a central axis aligned with the handling string when so attached; a plurality of jaw members each carried by the body for movement between an inactive position and an active position,

the jaw members depending from the body and being circumferentially spaced about said central axis, the jaw members having portions constructed and arranged to operatively engage the hollow member when the jaw members are actuated to their active positions while the



body is in a predetermined position relative to the hollow member;

downwardly directed locator means carried by the body and constructed and arranged for engagement with the hollow member to position the body in said predetermined position as the tool is landed;

remotely operable actuating means for moving the jaw members simultaneously from their inactive positions to their active positions to secure the tool body to the hollow member when the tool body is in said predetermined position; and additional means depending from the body in alignment with said central axis and by which the underwater device to be retrieved or installed can be connected to the body.

4,443,131

METHOD FOR CONSTRUCTING AN OFFSHORE PLATFORM STRUCTURE HAVING A PLURALITY OF SUPPORTING LEGS INCLINED INWARDLY TOWARDS EACH OTHER

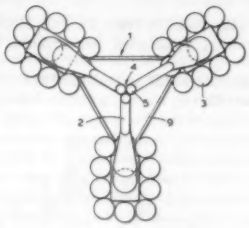
Olav Olsen, Oslo, Norway, assignor to Ingenior Thor Furuholmen A/S; A/S Hoyer-Ellefsen and Ingenior F. Selmer A/S, all of Oslo, Norway

Filed Mar. 4, 1982, Ser. No. 354,533

Int. Cl.³ E02B *17/00*

U.S. Cl. 405—203 **10 Claims**

1. A method for constructing an offshore platform structure, the platform structure including a foundation on which are supporting platform legs for supporting a platform deck, the method comprising: constructing a foundation body on the bottom of a dry dock; casting supporting legs by slipforming in a vertical direction starting with their lower ends said legs being evenly spaced within the foundation body; tilting the top end portions of the supporting legs towards one another upon completion of casting; connecting the upper end portions of the supporting legs rigidly with one another; rigidly securing the lower ends of the supporting legs to the foundation body; and slipforming a vertical deck support structure on the top of



the connected supporting legs, so that the dry dock can be flooded and the structure towed to an offshore location.

4,443,132

ANCHORING OF TENSION MEMBERS

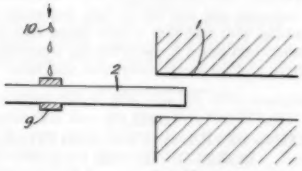
Bernhard Kotulla; Martin Weiser, both of Cologne; Jürgen Faltin, Roesrath; Lothar Preis, Cologne; Rudolf Schmidt, Burscheid, and Eberhard Born, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Strabag Bau-AG, Cologne, both of, Fed. Rep. of Germany

Continuation of Ser. No. 48,298, Jun. 13, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,417

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1978, 2827327

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—260 **2 Claims**



1. In a process for securing an anchor which can be prestressed and retightened in a borehole in rock, wherein a tension member is glued in the borehole by a reaction resin, the improvement wherein: the tension member is pushed with a packer comprising a foamable sleeve fixed thereon into the borehole which is spaced from the end of the tension member in the borehole by a length corresponding to the length of the portion of the tension member to be glued; the sleeve is wet prior to the pushing step to foam up the packer; and a reactive resin is injected into the borehole behind the packer.

4,443,133

METHOD FOR ACHIEVING ACCEPTABLE U_3O_8 LEVELS IN A RESTORED FORMATION

Richard B. Barrett, Chatham, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

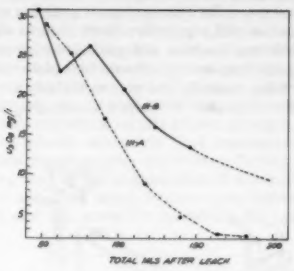
Filed Nov. 27, 1981, Ser. No. 325,280

Int. Cl.³ C09K *17/00*; E21B *43/28*; E21C *41/08*

U.S. Cl. 405—263 **9 Claims**

1. A method of restoring a formation which had uranium and other mineral values therein extracted by an aqueous alkaline lixiviant, whereby an aqueous solution remains in said formation said restoration method comprising adjusting the pH of the aqueous solution in said formation to a range of from about 5 to about 12 and introducing into said formation a

source of phosphate in an amount sufficient to lower the level of soluble uranium compounds below that previously existing



in the formation by the formation of insoluble hexavalent uranium phosphate compounds.

4,443,134

YIELDABLE ROOF SUPPORT FOR MINE PASSAGES AND THE LIKE

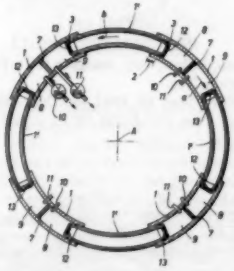
Reinhold Gross, Heiligenhaus; Dietrich Willuhn, Troisdorf, and Horst Witte, Mülheim, all of Fed. Rep. of Germany, assignors to Klöckner-Werke Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Jun. 17, 1981, Ser. No. 274,714

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026837

Int. Cl.³ E21D *15/44*

U.S. Cl. 405—288 **13 Claims**



1. A yieldable roof support structure for mine passages, tunnel extensions, and the like, comprising an arch structure formed of at least one longitudinally extending outer segment and at least one longitudinally extending inner segment each of hollow construction having enclosed sides and being frictionally joined together in a fluid tight manner in telescoping end-to-end relationship to form an arched support frame, an end of said inner segment being oversized relative to an end of said outer segment and extending into same, said outer segment being of elastic material permitting distortion thereof at said joined ends without permanent deformation to thereby define a yieldable roof support, means for solely facilitating disassembly of said segments during non-use, said means comprising transversely extending separating walls in said segments defining at least one pressure chamber in which said outer segment forms a pressure cylinder and said inner segment forms a piston at said joined ends, means for applying fluid pressure to said chamber for moving said segments apart during the disassembly thereof, and said outer segment comprising a pair of longitudinally extending mating sections releasably secured together to further facilitate disassembly of said segments during non-use.

4,443,135

CONTROL APPARATUS

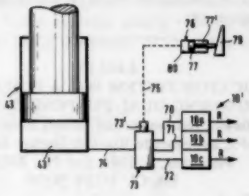
Klaus Beckmann, Lunen; Hans-Theodor Grisebach, Unna, and Walter Weirich, Dortmund, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Fed. Rep. of Germany

Filed Dec. 30, 1981, Ser. No. 335,827

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1981, 3100093

Int. Cl.³ E21D *15/46*

U.S. Cl. 405—302 **28 Claims**



1. In a mine roof support unit comprising a floor-engageable structure, and a roof engageable structure supported above the floor-engageable structure by inclined hydraulic prop means, the inclination of the hydraulic prop means relative to the vertical increasing as the hydraulic prop means is retracted, the improvement comprising providing control apparatus for controlling the load-bearing capacity of the hydraulic prop means, the control apparatus comprising pressure-relief valve means for limiting the pressure of the hydraulic fluid supplied to the hydraulic prop means, and a setting device for adjusting the operating pressure of the pressure-relief valve means thereby controlling the load-bearing capacity of the hydraulic prop means, wherein the setting device is operatively associated with a movable part of the roof support unit in such a manner that the operating pressure of the pressure-relief valve means is reduced in response to movement of said movable part of the roof support unit which results from extension of the hydraulic prop means.

4,443,136

MACHINE CUTTING TOOL

Klaus Kemmer, Wilberg, Fed. Rep. of Germany, assignor to ISCAR Hartmetall Gesellschaft mit beschrankter Haftung, Fed. Rep. of Germany

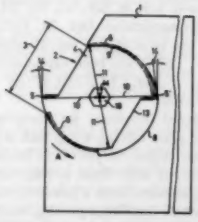
PCT No. PCT/DE82/00033, 371 Date Oct. 19, 1982, 102(e) Date Oct. 19, 1982, PCT Pub. No. WO82/02845, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 19, 1982, Ser. No. 438,885

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3106120

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—72 **11 Claims**



1. A machine cutting tool comprising replaceable cutting inserts (4) and a holder (2) for a self-gripping attachment of said cutting insert (4), two seat jaws opposite each other, contact surfaces (6) which are formed complementary to oppo-

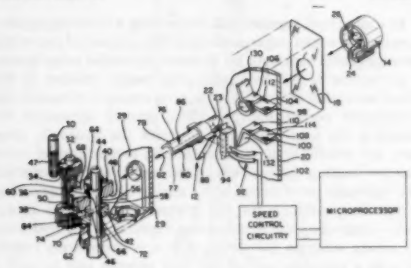
site when in working position, contact surfaces (9) of said cutting insert (4), and convex or concave guide means (7), (12) in the contact surfaces, characterized in that said cutting insert is insertable into said holder (2) by being turned about an axis M parallel to a cutting edge (5) in the direction of the forces acting on said cutting edge (5), the contact surfaces (6) have the shape of an approximate circular arc about the center of rotation M of said cutting insert (4) whose distance (10,11) from the center of rotation decreases in the direction of turning, and there is provided an insert groove (8) in the depth of said holder (2) between said contact surfaces (6) and a flat segment (13) at the cutting insert (4) which is adjacent to said contact surfaces (9).

4,443,137

INDICATOR SYSTEM FOR A POWER TOOL COMPRISING DUAL PURPOSE CAM SHAFT

Gary W. Albrent, Baltimore, and Robert Bradus, Randallstown, both of Md., assignors to Black & Decker Inc., Newark, Del.

Filed Aug. 7, 1981, Ser. No. 290,939
Int. Cl.³ B23B *39/04*
U.S. Cl. 408—9 **10 Claims**



1. A cam shaft for use in power tools having microprocessor-operated speed control circuitry, multiple gear ratios and a multiple gear ratio drive mechanism, said cam shaft comprising:

a shaft;

a first cam member associated with said shaft and with said drive mechanism and adapted to cooperate with said shaft to effect shifting of said drive mechanism between said gear ratios;

and a second cam member, associated with said shaft and said first cam member and adapted to communicate to said microprocessor, through said circuitry, the gear ratio through which said drive mechanism operates, selected by means of said shaft and first cam member.

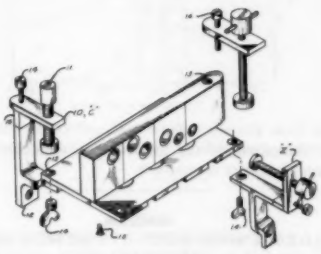
4,443,138

DOWELING JIG

Anthony W. Butera, 112 Tuthill St., Port Jefferson, N.Y. 11777

Continuation-in-part of Ser. No. 96,753, Nov. 23, 1979, abandoned. This application Dec. 28, 1981, Ser. No. 334,555
The portion of the term of this patent subsequent to Mar. 22, 2000, has been disclaimed.
Int. Cl.³ B23B *47/28*
U.S. Cl. 408—115 R **20 Claims**

1. A "T" shaped doweling jig comprising a substantially rectangular base plate having a top face with two parallel side edges, at least one alignment port hole formed through said top face, said alignment port hole having sides which taper in ramp-like configuration from a predetermined larger opening to a predetermined smaller opening, at least one ramp-like tapered cut-out formed in each of said side edges, at least one defined straight port hole girth line extending across said top face from one of said cut-outs to another of said cut-outs, said girth line bisecting said alignment port hole, a substantially rectangular drill bit guide hole member having a top surface with two parallel side edges with a thickness less than said predetermined smaller opening, at least one defined drill bit guide hole extending transversely through said guide hole member, at least one defined straight guide girth line extending transversely across said top surface from edge to edge, said guide hole girth line bisecting said guide hole, means for attaching said guide hole member to said base plate, said guide hole member being centrally and perpendicularly attached to said base plate to form said "T" shaped doweling jig and inter-



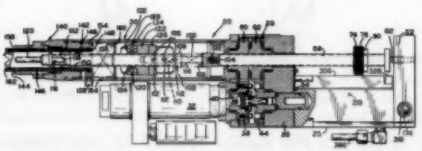
sect said alignment port hole, wherein said means for attaching includes a parallel piped shaped shim having a predetermined thickness inserted between said base plate and said guide hole member, spacing said base plate from said guide hole member by a distance equal to the thickness of the shim, whereby said doweling jig is adapted to drill holes having an offset which is determined by the thickness of the shim, clamp means for attaching said doweling jig to a workpiece, and means for removably attaching said clamp means to said doweling jig.

4,443,139

POSITIVE FEED DRILL

Joseph D. Eash, Euless, Tex., assignor to In-Tex Tool Corporation, Arlington, Tex.

Filed Mar. 18, 1982, Ser. No. 359,247
Int. Cl.³ B23B *39/10, 47/22*
U.S. Cl. 408—14 **19 Claims**



1. Positive feed drill apparatus comprising a supporting frame which carries an elongated spindle for rotary and reversible longitudinal movement, drive means on said supporting frame for selectively imparting said movement to said spindle, said supporting frame including a U-shaped frame assembly of rigid blocks removably fixedly secured together, said drive means including a fluid powered motor on said supporting frame and fluid-operating means integrated with said frame assembly, one of the arms of said U-shaped frame assembly having an opening therein which receives said spindle for rotary and longitudinal movement, said spindle having opposite ends and being further mounted to traverse the distance between said arms and within the spaced defined by the exterior thereof such that said longitudinal movement results in one spindle end being movable toward and away from the other of said arms; said fluid-operating means including valves and passages with said passages being disposed internally of said frame assembly and said valve also being disposed internally with portions of certain valve being accessible externally thereof, said fluid-operating means controlling the starting and

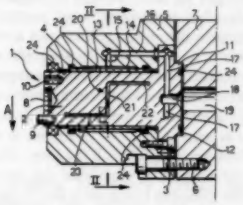
stopping of the motor, the advancement of said spindle and the depth of drilling, the retraction of said spindle and the limiting of the retractable movement thereof; said frame assembly including a central manifold body having opposite front and rear ends, a manifold plate fixedly superposed on said body, a front manifold block secured to the front end of said body which serves as one arm of said U-shape, and a rear manifold block secured to the rear end of said body which serves as the other arm of said U-shape, said body, plate, front and rear blocks each containing certain of said passages and being arranged to provide selectively fluid communication therebetween, said fluid-operating means being further characterized by having none of the passages thereof external of said frame assembly, and an air supply line extending between said frame assembly and said motor for controlling the operation of the latter.

4,443,140

TOOL HOLDER WITH MEANS FOR RADIAL ADJUSTMENT

Lorenzo Boetto, Via Chivasso 8, San Mauro Torinese (Turin), Italy

Filed Feb. 10, 1982, Ser. No. 347,544
Claims priority, application Italy, Feb. 12, 1981, 67196 A/81
Int. Cl.³ B23B *29/18*
U.S. Cl. 408—147 **4 Claims**



1. A tool-holder for machine tools, particularly boring machines, of the type having: a cylindrical body with a part which supports a tool; at least one slot defined by said body and shaped so that said part of the body which supports the tool is displaceable resiliently relative to the remaining part of the body in a direction perpendicular to the axis of the body, and hydraulic means for effecting the transverse displacement of said tool support part to adjust the radial position of the tool, the improvement comprising; said hydraulic means includes passage means arranged so as to provide a supply of fluid under pressure into an annular chamber and distributing the pressure in order to exert a substantially uniform pressure over the outer surface of said body.

4,443,141

PINLESS PRESSURE FOOT FOR MACHINE TOOL

Wojciech B. Kosmowski, San Juan Capistrano, Calif., assignor to Cooper Industries, Houston, Tex.

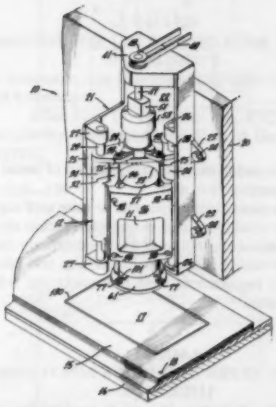
Filed Feb. 22, 1982, Ser. No. 351,213
Int. Cl.³ B23C *3/00, 9/00;* B27C *5/06*
U.S. Cl. 409—163 **14 Claims**

1. In combination with a machine tool having a spindle means, a cutting tool connected to one end of said spindle means, and worktable means for supporting a workpiece for being cut by said cutting tool, said worktable means and said spindle means being relatively laterally movable for producing a cut in said workpiece along a predetermined line, which cut, upon completion thereof, will produce a cutout part from the portion of said workpiece within said line, said cutting tool exerting a relative lateral force on said workpiece such that when said cutting tool has reached a predetermined point on said line and prior to completion of said cut, said cutting tool will cause lateral motion of said portion of said workpiece relative to said worktable means unless said portion is restrained, a device for selectively restraining said portion of said workpiece comprising:

workpiece engagable means circumscribing said cutting tool and being movable axially relative to said one end of said spindle means for selectively engaging the surface of said portion of said workpiece;

a plurality of elongate flexure members extending around said spindle means, first ends of said flexure members being connected to said workpiece engagable means;

drive means positioned adjacent the other end of said spindle means and being movable axially relative thereto, said drive means being connected to the other ends of said



flexure members for moving said workpiece engagable means into contact with said portion of said workpiece, said flexure members transmitting the axial force of said drive means to said workpiece engagable means to force said workpiece against said worktable means for preventing movement thereof relative to said worktable means during completion of said cut, said flexure members being unsupported between said ends thereof and being laterally flexible to support said workpiece engagable means for lateral movement relative to said cutting tool during completion of said cut; and

locking means for selectively preventing lateral movement of said workpiece engagable means relative to said cutting tool.

4,443,142

DEVICE FOR MILLING LONG WORKPIECES

Gottfried Blaimschein, Steyr, Austria, assignor to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H., Steyr, Austria

Division of Ser. No. 186,112, Sep. 11, 1980, Pat. No. 4,388,027. This application Apr. 30, 1982, Ser. No. 373,345
Claims priority, application Austria, Oct. 16, 1979, 6722/79
Int. Cl.³ B23C *3/06;* B23B *1/24*
U.S. Cl. 409—199 **6 Claims**

1. In a backrest for supporting a workpiece near the center of its length in a milling machine, which backrest comprises

a supporting jaw adapted to be disposed under the workpiece near the center of the length of the workpiece and to be vertically raised to engage the workpiece from below in a position of initial contact when said workpiece is held in a position in which it has a free sag near the center of its length,

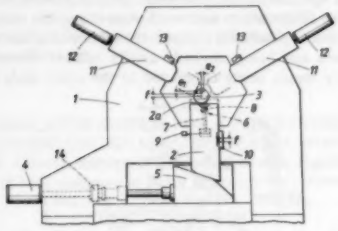
a retaining jaw, which is adapted to be disposed above the workpiece near the center of the length of the workpiece

and to be moved downwardly toward the workpiece to clamp the latter against the supporting jaw,

first drive means for vertically moving said supporting jaw independently of said retaining jaw, and

second drive means for moving said retaining jaw toward and away from the workpiece independently of said supporting jaw

the improvement comprising



a detector arranged to indicate said position of initial contact of said supporting jaw, and

said first drive means being operable to raise said supporting jaw and the workpiece to a preselected extent above said position of initial contact so as to eliminate only the elastic deformation which is due to said free sag, and said retaining jaw into engagement with the workpiece which has thus been raised.

4,443,143

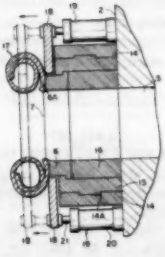
BILLET SCALPER AND DRIVE MECHANISM THEREFOR

Akira Asari, Osaka; Tatsuhiko Noyori, Kobe; Hidehiro Tsuzuki, Kobe; Takahisa Tabuchi, Kobe; Tsuneharu Masuda, Kobe, all of Japan, and Tetsuro Takehata, deceased, late of Osaka, Japan (by Akemi Takehata, legal representative), assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Mar. 8, 1982, Ser. No. 355,341

Int. Cl.³ B21C *43/02*; B23D *79/12*; B23P *25/00*

U.S. Cl. 409—295 **6 Claims**



1. A billet scalper, comprising:

a die assembly mounted on a first frame and including a scalping die;

a pressing mechanism supported on a second frame opposing said first frame and having a pressing stem movable toward and away from and in axial alignment with said scalping die for pressing a billet against said scalping die;

a chip ejector movably mounted around the circumference of said scalping die; and

drive means mounted on said first frame for axially moving said chip ejector toward said pressing mechanism beyond one end face of said scalping die to remove chips therefrom.

4,443,144

LOCKING PIN FOR A SPINDLE OR SIMILAR ELEMENT, MORE ESPECIALLY FOR AGRICULTURAL EQUIPMENT

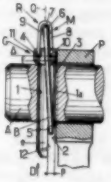
Hubert Defrance, 7, rue Guillaume Apollinaire, 51100 Reims, France

Filed Dec. 15, 1981, Ser. No. 330,804

Claims priority, application France, Dec. 17, 1980, 80 26810; Mar. 6, 1981, 81 04555

Int. Cl.³ F16B *21/00*

U.S. Cl. 411—351 **14 Claims**



1. A locking pin for a spindle, or similar element, equipped with a loop and means for pivoting the loop on the locking pin so that said loop may be brought back to surround the spindle, or similar element, in which the locking pin is engaged, so as to oppose removal of said locking pin, the means for pivoting the loop being arranged so as to be able to assume at least two positions namely a first position or "low" position in which the locking pin may pass through said loop and a second position or "high" position in which the locking pin may not pass through the loop, the end of the locking pin opposite the pivoting means then coming into abutment against a portion of the loop, said pivoting means comprising a mobile bearing capable of being placed at least in said two positions, in which bearing is engaged a pivot pin integral with the loop, characterized by the fact that the bearing is supported by two substantially parallel arms, the assembly being such that in the second position or "high" position the arms extend on one side which moves the bearing to a maximum away from the opposite end of the locking pin, whereas in the first "low" position, said arms have rotated with respect to the "high" position.

4,443,145

SELF-SEALING WASHER

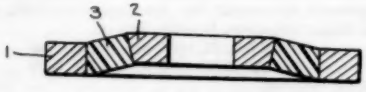
Klaus-Jurgen Peschges, Laudenbach, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,281

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 8103909[U]

Int. Cl.³ F16B *43/00*

U.S. Cl. 411—542 **10 Claims**



1. A self-sealing washer, comprising an inner spacer ring, a concentric middle sealing ring and a concentric outer spacer ring, wherein the spacer rings are made of non-resilient material, the sealing ring is made of resilient, constant volume material, a circular gap separates the inner ring and the outer ring which are axially offset relative to each other, the sealing ring bridges the gap and at least one conically circular clamping surface of the inner and/or outer ring projects into the gap which is inclined so that a reduction of the volume of the

sealing ring results when the mutual axial distance of the spacer rings is reduced.

4,443,146

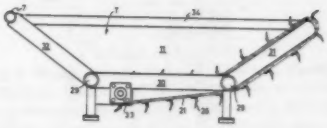
BALE FEEDING APPARATUS

Andrew R. Duncan, 66 Kurapae Rd., Taupo, New Zealand

Continuation of Ser. No. 174,660, Aug. 1, 1980, abandoned. This application Dec. 30, 1982, Ser. No. 454,882

Int. Cl.³ A01D *90/10*

U.S. Cl. 414—24.6 **8 Claims**



1. A hay bale feeder comprising a front framework portion adapted for connection with a feeder transporting means, spaced apart first and second side framework portions each having upper and lower ends defining a trough therebetween, said trough being adapted to receive a round bale of hay, a single endless feed-out conveyor having hay removing means thereon and having an upper conveying run extending across said trough in a direction substantially transverse to said side framework portions with an inclined portion of said upper conveying run extending over the upper end of said first side framework portion, said upper conveying run being suspended across said trough so as to engageably support and rotate the round bale while conforming to the shape thereof when the bale is positioned within said trough and so that operation of said hay removing means with said feed-out conveyor feeds out hay from said bale over said first side framework portion.

4,443,147

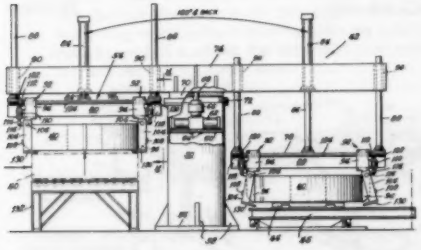
TURRET STACKER

Lawrence J. Richards, Elk Grove Village, Ill., assignor to Braner Enterprises, Inc., Schiller Park, Ill.

Division of Ser. No. 422,721, Sep. 24, 1982, which is a continuation-in-part of Ser. No. 288,479, Jul. 30, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 513,358

Int. Cl.³ B65G *57/03*

U.S. Cl. 414—71 **7 Claims**



1. A transporting device for relocating material from one position to a second position, said transporting device comprising:

a. a stationary central support pedestal,

b. a rotatable turret situated at the top of said pedestal, said turret including

i. at least two arms each of which extends radially outwardly from said pedestal

ii. a lifting and stacking mechanism associated with each arm, said mechanism including a material support, means to raise and lower said material support, and means to enlarge and contract said material support to accommodate material of varying horizontal dimensions,

iii. said material support comprising a beam beneath said arm and a pair of carriages each carriage being moveable along said beam in a direction opposite to the other carriage, said carriages including rests for holding material to be relocated, each said rest comprising a leg pivotally attached to said carriage, and further including means connected between said carriage and said leg for pivoting said leg toward and away from the material to be transported,

c. bearing means between said pedestal and said turret to facilitate rotation of said turret, and

d. driving means situated in said pedestal and attached to said turret to rotate said turret.

4,443,148

APPARATUS FOR UNLOADING BULK MATERIAL FROM SHIPS

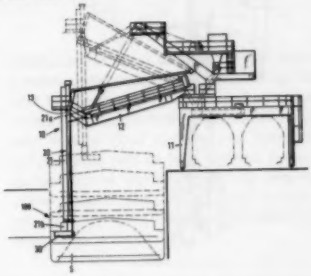
Gerhard Arnemann, Am Kroenrey 11, D-2083 Halstenbek, Fed. Rep. of Germany

Filed May 17, 1982, Ser. No. 379,142

Claims priority, application Fed. Rep. of Germany, May 14, 1981, 3119292

Int. Cl.³ B65G *63/00*

U.S. Cl. 414—139 **10 Claims**



1. An apparatus for unloading bulk material from ships comprising an elongated vertical conveyor, means for dependently pivotally supporting the upper end of said vertical conveyor, said vertical conveyor comprises an elongated vertical conveyor screw having a vertical axis and an elongated vertical bracing tube laterally enclosing said vertical conveyor screw so that said vertical conveyor screw can convey loose material from the lower end to the upper end of said vertical bracing tube, only a single elongated horizontal conveyor having a first end and a second end with the first end thereof located adjacent the lower end of said vertical screw conveyor, said horizontal conveyor comprising only a single elongated horizontal conveyor screw having a first end and a second end and a horizontal axis, and a casing extending along said horizontal conveyor screw having a first end and a second end, wherein the improvement comprises that said vertical screw conveyor has a lower end and an upper end with the lower end thereof extending downwardly out of the lower end of said bracing tube, said horizontal conveyor has a top side, a bottom side, and first and second sides extending between the top and bottom sides and located on opposite sides of said horizontal screw conveyor, said casing for said horizontal conveyor extends along the second side of and over the top side of said horizontal screw conveyor and said casing is open along the first side and the bottom side of said horizontal screw conveyor, said casing is closed at the first and second ends of said horizontal screw conveyor, and the first end of said casing is located adjacent the lower end of said vertical screw conveyor and the first end of said casing comprises a guide plate

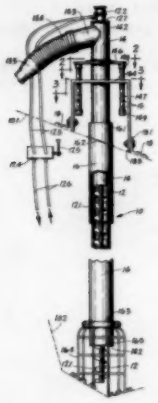
extending transversely across and obliquely of the axis of said horizontal screw conveyor from the first side to the second side of said horizontal screw conveyor for guiding the material conveyed by said horizontal screw conveyor to the lower end of said vertical screw conveyor, wherein the axis of said horizontal screw conveyor is offset laterally from the axis of said vertical screw conveyor so that the first side of said horizontal screw conveyor is closer to the axis of said vertical screw conveyor than the second side of said horizontal screw conveyor.

4,443,149

AXIALLY MOVEABLE AUGER

Douglas T. Isaacson, West Fargo, N. Dak., assignor to Bruce Halland, Fargo, N. Dak.

Filed Sep. 28, 1981, Ser. No. 305,948
Int. Cl.³ B65G *33/14, 3/00*
U.S. Cl. 414—326 **6 Claims**



1. An auger assembly for transporting particulate material from a bin or the like and comprising an auger rotatable about its axis, a stationary tube having a particle-receiving end and within which the auger is rotatably moveable and freely axially moveable between a first position in which an end of the auger protrudes from the particle-receiving end of the tube and a second position in which an end of the auger is within the particle-receiving end of the tube, means for rotating the auger to draw particulate material within the particle-receiving end of the tube, means for reversing the direction of rotation of the auger to unthread the auger from particulate material adjacent the particle-receiving end of the tube and causing the auger to move axially toward the second position, and limit means limiting the free axial movement of the auger with respect to the tube between said first and second positions.

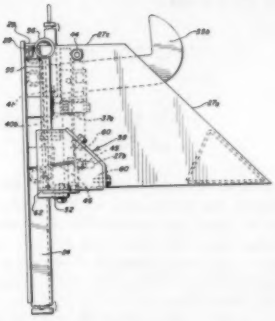
4,443,150

RELEASABLE LOCKING DEVICE

Norbert Hahn, Cudahy; Steven J. Hipp, Milwaukee, and Michael A. Swessel, Cudahy, all of Wis., assignors to Rite-Hite Corporation, Milwaukee, Wis.

Filed Nov. 13, 1981, Ser. No. 321,044
Int. Cl.³ B65G *69/00*
U.S. Cl. 414—401 **9 Claims**

1. A releasable locking device for securing a parked vehicle to an adjacent structure, said device comprising a carriage having a first section adapted to be affixed to the adjacent structure, and a second section mounted on said first section and biased to assume a predetermined elevated position, said second section being movable downwardly from said elevated position upon an external force of a predetermined magnitude being exerted on said second section; a first means mounted on said carriage second section for relative rectilinear movement with respect thereto between an operative vehicle-locking mode and an inoperative vehicle-release mode; releasable second means mounted on and substantially concealed by the carriage second section and coacting therewith and said first means for retaining the latter in said operative mode; manually actuated third means carried on said carriage second section and movable independently thereof between extended and retracted positions, when moving from a retracted position to



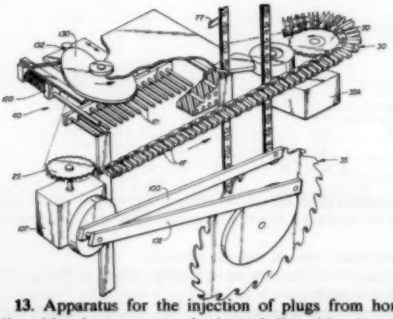
an extended position said third means effecting relative movement of said first means from said inoperative mode to said operative mode, said third means normally assuming a retracted position and being substantially concealed within said carriage second section; and manually actuated fourth means adjustably mounted on said carriage second section and engageable with said second means to effect movement of the latter to a non-retaining position with respect to said first means, when said fourth means is manually actuated in one relative direction.

4,443,151

AUTOMATIC SOIL PLUG LOADER AND FEEDER

Errol C. Armstrong; William A. Hanacek, both of Salinas, and Thomas A. Spinetti, Watsonville, all of Calif., assignors to Bud Antle, Inc., Salinas, Calif.

Filed Jul. 9, 1980, Ser. No. 167,289
Int. Cl.³ A01C *11/00*
U.S. Cl. 414—404 **16 Claims**



13. Apparatus for the injection of plugs from horizontal disposition in a tray to a horizontal disposition in a passing conveyor, said plugs have a tapered configuration defined by correspondingly tapered cavities in said tray so that upon ejection from said tray, a given plug becomes progressively less tightly held by its respective cavity so that the foliage end

of a plug being ejected has a tendency to angulate downwardly, said apparatus comprising:

means for ejecting plugs from said trays including an ejection for urging said plugs from said trays;

a lip extending horizontally along a front surface of said tray in the direction of a row of plugs being ejected, said lip including an upper portion that is at an elevation above the lowermost point of the row of cavities so as to slightly intrude into the path of the corresponding plugs being ejected and deflect said plugs upwardly to counteract said tendency to angulate downwardly.

4,443,152

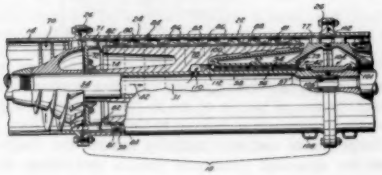
AXIAL SLURRY PUMP

George S. Wong, Agoura; Fritz C. Catterfeld, Canoga Park, and Clifford A. Hauenstein, Woodland Hills, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 838,609, Oct. 3, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 23,801

Int. Cl.³ F04D *29/18*

U.S. Cl. 415—143 **4 Claims**



1. An axial flow pump for the transportation of liquids containing solids wherein said axial flow pump comprises a cylindrical conduit housing a concentrically positioned drive shaft and at least one pressure stage having a rotor and a stator coaxially positioned along said drive shaft and wherein the improvement comprises an inducer stage comprising:

a tandem-blade row inducer coaxially mounted on said drive shaft, and wherein said tandem-blade row inducer comprises a first blade row having blades of low hub ratio and high solidity, a first blade row discharge zone, and a second blade row having blades of high hub ratio and low solidity; and

an inducer stage stator, hydraulically matched to accept the output of said tandem-blade row inducer, to diffuse and turn the flow discharge in the direction of rotation of the succeeding rotor rotation thereby reducing relative inlet velocity, and to establish the same inlet flow conditions for each succeeding pump stage.

4,443,153

CONTROLLED EXHAUST-TYPE SUPERCHARGER TURBINE

Günther Dibelius, Fichthang 11, D-5100 Aachen, Fed. Rep. of Germany

Filed Aug. 21, 1980, Ser. No. 180,067

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1979, 2934041

Int. Cl.³ F01D *17/14, 17/18*; F02B *37/12*

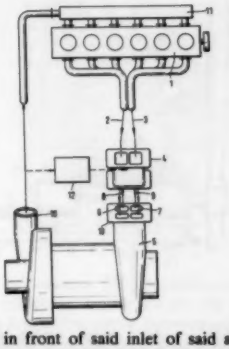
U.S. Cl. 415—151 **3 Claims**

1. A controlled exhaust driven turbo-supercharger for an engine having exhaust flow conduits for discharging exhaust flow streams from the engine and designed for an engine speed below the rated speed of the engine to be supercharged, comprising:

a turbine having a rotor;

a vaneless, exhaust stream guidance device having at least two separate, continuously open inlet flow conduits, each of which has an inlet and an outlet, the inlets of which are each connectable to a certain exhaust stream of the exhaust flow conduits of the engine, and at least one additional flow conduit having an inlet and an outlet disposed in parallel to said inlet flow conduits, the center of the cross-sectional area of which is at a shorter radial distance from the turbine axis than the centers of the cross-section areas of said inlet flow conduits, said outlets of said inlet flow conduits as well as of said additional flow conduit surrounding the whole circumference of said turbine rotor; and

control means mounted on said vaneless guidance device



positioned in front of said inlet of said additional flow conduits, said control means including valve means movable between a fully opened and closed position for connecting said additional flow conduit to at least certain of said exhaust flow streams, and means for moving said valve means into its fully opened position the more the turbine speed increases, thereby connecting said additional conduit with the exhaust streams supplying said continuously open inlet flow conduits so as to increase the flow cross section.

4,443,154

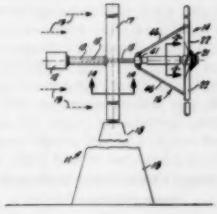
WINDMILL TOWER SHADOW ELIMINATOR

Arthur J. Randolph, P.O. Box 1541, Santa Rosa, Calif. 95405

Division of Ser. No. 69,800, Aug. 27, 1979, Pat. No. 4,310,284. This application Aug. 24, 1981, Ser. No. 295,735

Int. Cl.³ F03D *11/04*

U.S. Cl. 416—11 **3 Claims**

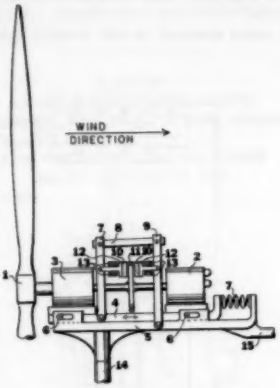


1. A windmill propeller system having a propeller with a pair of diametrically opposed blades mounted on a drive shaft and comprising an elongated drive shaft support mounting said shaft in rotatable relation thereto and having a surrounding airfoil surface pivotally mounted to move with said propeller for direction into a wind and extending above and below said shaft a distance at least equal to the length of said propeller blades for alignment with said blades every half revolution of said propeller to minimize unequal wind forces applied to said propeller blades.

4,443,155
WIND ROTOR THRUST-ACTUATED BRAKE

Donald R. Smith, 559 63rd St., Oakland, Calif. 94609

Filed Oct. 6, 1980, Ser. No. 193,953
Int. Cl.³ F03D 7/02
U.S. Cl. 416—32 1 Claim



1. A fluid driven turbine system which is self-governing above a predetermined fluid velocity, comprising:

(a) a turbine rotated by a fluid moving relative to it, said turbine comprising any desired number of blades operatively connected to a hub and said fluid being wind,

(b) support means for said turbine comprising a carrier on which is mounted both said turbine and an energy conversion device driven by it,

(c) support means for said carrier allowing a small amount of backward movement for said turbine and carrier, said movement being along the direction of flow of said wind and in response to the thrust forces on said blades produced by operation in said wind, during said movement said support means for said carrier constraining the rotational axis of said turbine to remain substantially parallel to its original position,

(d) friction brake means operatively connected to and interposed between said carrier and a shaft rotationally connected to said turbine,

(e) resisting means incorporated in said carrier support means to supply a force opposing said backward movement so that the distance of said movement is dependent on the magnitude of said thrust forces and thus on the velocity of said wind, said resisting means comprising a mechanical spring interposed between said carrier and the base of said support means for said carrier, and

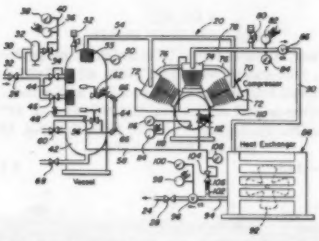
(f) engagement means effecting application of said brake means when said backward movement exceeds a predetermined value, said brake engagement means comprising a system of links operatively connected to and interposed between said carrier and said carrier support means, said links also being connected to said brake means to actuate said brake means through said backward movement.

4,443,156
AUTOMATIC NATURAL GAS COMPRESSOR CONTROL SYSTEM

James A. Dunnam, Jr., 1781 Spy Glass Dr., No. 249, Austin, Tex. 78746

Filed Feb. 10, 1981, Ser. No. 233,126
Int. Cl.³ F04B 49/00
U.S. Cl. 417—12 9 Claims

1. A control system for a compressor utilized for transferring natural gas from a producing well or other source at a relatively low pressure to a discharge pipe for transmission to users at a relatively high pressure, said system comprising a compressor having drive means connected thereto, inlet means connected with the compressor for suppling low pressure natural gas thereto, discharge means connected with the compressor for discharge of high pressure gas therefrom, sensing means in the inlet means to maintain a substantially constant gas flow to the compressor regardless of gas pressure fluctuations from the gas source and to shut down the compressor in response to abnormal inlet conditions and automatically re-

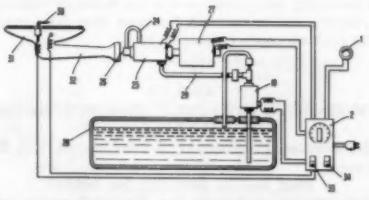


start the compressor when such abnormal conditions correct themselves, said discharge means including sensing means to control the rate of supply of gas to the compressor and shut down the compressor in response to abnormal conditions in the discharge means and automatically re-start the compressor when the abnormal conditions correct themselves thereby minimizing down time of the compressor by automatically re-starting the compressor when abnormal conditions which shut down the compressor correct themselves without manual re-starting of the compressor.

4,443,157
CONTROL CIRCUIT FOR A LIQUID FUEL COMBUSTION APPARATUS

Hisao Yoshii, Sanjo, Japan, assignor to Dainichi Kogyo Co., Ltd., Shirone, Japan

Filed Apr. 23, 1981, Ser. No. 256,912
Claims priority, application Japan, Apr. 28, 1980, 55-58979[U]
Int. Cl.³ F04B 49/06; G05B 11/18
U.S. Cl. 417—45 9 Claims



1. A control circuit for a liquid fuel combustion apparatus which utilizes a fuel pump for feeding a liquid fuel, comprising:

(a) circuit means including a thermo-sensitive element and a variable resistor for providing a first signal which represents the difference between the temperature sensed by said thermo-sensitive element and a temperature represented by the setting of said variable resistor;

(b) means for converting said first signal to a second signal, said second signal having a first constant level when said temperatures sensed is a predetermined amount less than said temperature represented by the setting of said variable resistor, a second different constant level when said temperature sensed is a predetermined amount greater than said temperature represented by the setting of said

variable resistor, and said second signal being proportional to said first signal therebetween;

(c) a signal generator;

(d) means for rendering the operation of said signal generator responsive to the output of said means for converting; and

(e) means for controlling said fuel pump in response to said signal generator, said controlling means being operable to cause said fuel pump to deliver fuel for supporting strong combustion in said combustion apparatus in response to levels of said second signal below said first constant level, and operable to cause said fuel pump to gradually reduce the fuel delivery rate in response to levels of said second signal between said first and second constant levels, the fuel delivered by said fuel pump at said second signal second constant level being sufficient to maintain complete combustion in said combustion apparatus.

4,443,158

LIQUID RING PUMP WITH A CONTROL DISK ARRANGED BETWEEN THE IMPELLER HOUSING AND THE COVER

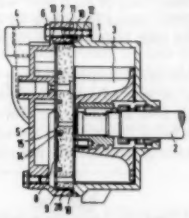
Benedikt Bentele, Hohenroth; Norbert Schmid, and Siegfried Schönwald, both of Bad Neustadt, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,294

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111538

Int. Cl.³ F04C *19/00*

U.S. Cl. 417—68 **5 Claims**



1. In a liquid ring pump comprising an impeller housing, a cover, a control disk interposed between the cover and the housing, and sealing means interposed between the cover and the control disk for sealing the cover and the disk and for sealing the interior of the impeller housing from the exterior thereof at the edge of the cover adjacent to the control disk, the improvement comprising a single cup-shaped seal interposed between the cover and the control disk for sealing the cover and the control disk and having at the free end of its circumferential wall a bead which extends radially outwardly, and the cover having a rim which extends beyond the circumferential wall, the seal being disposed to be pressed against the edge of the impeller housing by the rim of the cover.

4,443,159

POWER CONTROL DEVICE FOR PUMPS

Jörg Dantlgraber, Lohr-Sackenbach, Fed. Rep. of Germany, assignor to Mannesmann-Rexroth GmbH, Lohr, Fed. Rep. of Germany

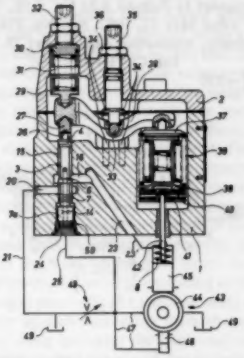
Filed Mar. 26, 1981, Ser. No. 249,665

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034115

Int. Cl.³ F04B *49/00*

U.S. Cl. 417—220 **5 Claims**

1. A power output control device for a pump of the type having a delivery adjuster including an adjustment member, a setting spring acting on the adjustment member, a control piston acted upon by the output flow from the pump and having means for controlling the delivery adjuster, governor spring means coupled to said piston for biasing the same against the output flow with a progressive force, additional biasing means acting on said control piston against said output delivery with a substantially constant force, means for adjusting said additional constant force including a rocking lever engaging said additional biasing means and said governor spring means, a first setting screw thrusting against said additional biasing means to adjust the biasing force thereof and a second setting screw thrusting againt said rocking lever to adjust the biasing force of said governor spring means.



4,443,160

HIGH-PRESSURE PISTON PUMP FOR LIQUIDS, PREFERABLY FOR WATER

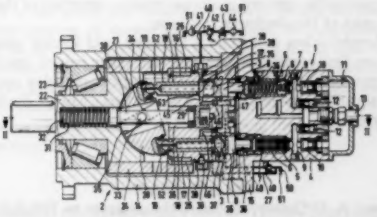
Heinz Berthold, Bildechingen, Fed. Rep. of Germany, assignor to Brueninghaus Hydraulik GmbH, Horb, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,065

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1980, 3042835

Int. Cl.³ F04B *1/18, 35/02*

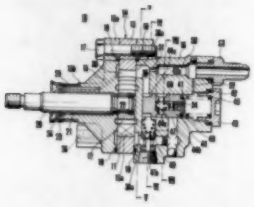
U.S. Cl. 417—270 **9 Claims**



1. In a high-pressure piston pump for liquids, particularly for water, including a valve control through a suction and pressure valve; a hydraulic drive for moving the pump piston at least in the pressure direction; the improvement comprising: said hydraulic drive including an axial piston machine of the oblique disk construction type, having an adjustable, rotationally driven oblique disk for stroke adjustment; drive pistons each coupled through a hydraulic column with one of the pump pistons; said hydraulic columns being connected with a pressure-limiting valve through a discharge valve opening only to the pressure-limiting valve, wherein an adjusting pressure is branched off dependent upon the pressure level in the hydraulic column, said pressure acting on the adjusting ar-

rangement of the adjustable oblique disk of said axial piston machine.

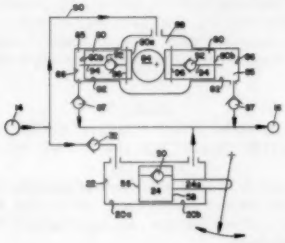
4,443,161
BALANCED DUAL CHAMBER OIL PUMP
Naosuke Masuda, and Takeshi Ohe, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan
Filed May 17, 1982, Ser. No. 378,746
Claims priority, application Japan, May 25, 1981, 56-79083
Int. Cl.³ F04B *47/08*
U.S. Cl. 417—310 **7 Claims**



1. An oil pump comprising:
a pump body including a rotor, a cam ring surrounding said rotor and formed with a pair of pump chambers at positions symmetrical with respect to an axis of said rotor;
suction passages and first and second pair of discharge passages opening in said pump chambers at positions a predetermined distance apart in the direction of rotation of said rotor;
a flow control valve formed in the axial direction of said pump body and including a valve opening and a spool slidable therein;
one pair of said discharge passages opening at one end of said valve opening while the other pair opening at an axial center of said valve opening at diametrically opposed positions;
said passages opening at the axial center of said valve opening being normally closed by said spool biased to an inoperative position;
check valves located between two pair of discharge passages;
said suction passages opening in said valve opening at diametrically opposed positions between openings of the two pairs of the discharge passages;
whereby when said spool is operated, said suction passages are first communicated with said other pair of discharge passages opening at the axial center of said valve opening and then communicated with said one pair of discharge passages.

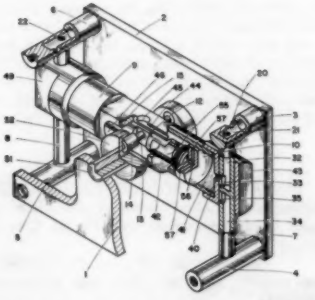
4,443,162
FLUID PUMP
Terence A. O'Connor, Elyria, Ohio, assignor to Teledyne Republic Manufacturing, Cleveland, Ohio
Filed Mar. 13, 1981, Ser. No. 243,491
Int. Cl.³ F04B *25/00*
U.S. Cl. 417—425 **7 Claims**

1. A pump assembly, comprising:
(a) an integral pump body defining at least one suction and one discharge port;
(b) a manually operable pump section including a pump body section defining a longitudinal bore;
(c) a piston member slidably supported for reciprocating motion by said bore, said member including a piston rod extending outside of said bore and operatively connected to a manually actuatable arm pivotally attached to said pump body section;
(d) a first flow path including a check valve communicating one portion of said bore with said suction port;
(e) a second flow path communicating another portion of said bore with said discharge port;
(f) check valve means carried by said piston, operative to allow fluid flow from said one portion to said other portion of said bore;
(g) a power operable pump forming part of said fluid pump assembly, including another pump body section, said other body section defining a pair of axially aligned bores, the inner ends of said bores communicating with a fluid inlet chamber defined in said other body section;



(h) a piston supported for sliding, reciprocating movement in each bore, each piston carrying a check valve operative to allow fluid flow through each piston from said inlet chamber to the outer ends of each bore;
(i) passage means including check valve means communicating said outer ends of each bore with said discharge port;
(j) piston drive means including an eccentric cam located within said inlet chamber and disposed intermediate said pistons;
(k) said piston drive means including a rotatable drive shaft extending outside of said other pump body section and engageable with a source of powered rotation, the axes of said bores being contained in a plane, said rotatable drive shaft extending substantially perpendicular to said plane.

4,443,163
FLUID MOTOR OR PUMP
Luis A. Gaither, 100 Summerstone, Irvine, Calif. 92714
Filed Jul. 15, 1982, Ser. No. 398,547
Int. Cl.³ F04B *19/02*; F01B *9/00, 15/00*
U.S. Cl. 417—466 **4 Claims**



1. A fluid motor or pump which comprises a front crank, a piston rod, a right piston, a left piston, a chamber, a right lateral conduit, a left lateral conduit, an upper left corner conduit, an upper right corner conduit, a lower right corner conduit, a lower left corner conduit and a front wall which holds said four corner conduits, said front wall supports said

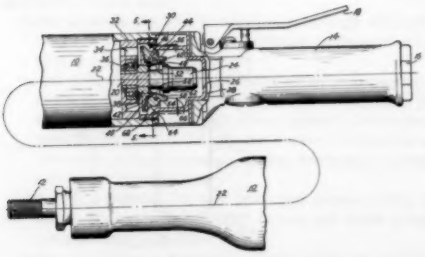
front crank and allows the crankshaft to rotate, said corner conduits communicate with said lateral conduits and the exterior, said upper right corner conduit and said lower right corner conduit hold and communicate with said right lateral conduit, said right lateral conduit internal upper area communicates with said upper right corner conduit and said right lateral conduit internal lower area communicates with said lower right corner conduit, said upper left corner conduit and said lower left corner conduit hold and communicate with said left lateral conduit, said left lateral conduit internal upper area communicates with said upper left corner conduit and said left lateral conduit internal lower area communicates with said lower left corner conduit, said lateral conduits support and allow said chamber to slide, said chamber has a main frame and two end walls, said chamber main frame has two internal end areas and a centered area, said chamber main frame has an upper conduit that allows said chamber right end internal area to communicate to the exterior, said chamber main frame has a lower conduit that allows said chamber left end internal area to communicate to the exterior, said chamber right end wall centered port allows said right lateral conduit internal areas to communicate with said chamber right end internal area, said chamber left end wall centered port allows said left lateral conduit internal areas to communicate with said chamber left end internal area, said chamber right end internal area allows said right piston to slide, said chamber left end internal area allows said left piston to slide, said chamber centered area allows said piston rod to slide and join said pistons, said piston rod center holds and allows the crankrod of said front crank to spin, said piston rod via said crankrod and the crankroller of said front crank communicates its sliding motion to said front crank causing a rotary motion of the crankwheel and crankshaft of said front crank or vice versa, said front crank via said crankroller causes said chamber to slide, said chamber sliding motion and position controls the fluid flow from said chamber internal areas to said lateral conduits or vice versa, said fluid flow is caused by the sliding motion of said pistons or vice versa, said fluid flow forced into and out of said fluid motor or pump will cause said fluid motor or pump to act as a motor, said crankshaft rotary motion will force fluid to flow into and out of said fluid motor or pump and cause said fluid motor or pump to act as a pump.

4,443,164

SECONDARY SPEED SENSOR FOR GOVERNED AIR GRINDERS

Lowell R. Bavin, West Unity, Ohio, assignor to The Aro Corporation, Bryan, Ohio

Filed Mar. 15, 1982, Ser. No. 358,305
Int. Cl.³ F01C *21/12*; F04C *15/02*
U.S. Cl. 418—41 **4 Claims**



1. A combined speed sensor and control valve for a rotary fluid motor of the type including a rotary shaft having a center line rotation axis, a fluid inlet for supplying fluid to the motor radially spaced from the shaft and shaft axis, said sensor and valve comprising, in combination:

a fluid inlet passage extending in the direction of the shaft for fluid flow into the inlet;

an annular valve member slidably mounted on the shaft for movement along the axis, said valve member including a disc portion extending radially from the shaft for a distance at least equal to the maximum radial extent of the fluid inlet from the center line axis of the shaft, said valve member being positioned upstream from the fluid inlet; said valve member also including a circumferential latching flange upstream from the disc portion;

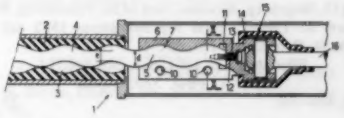
at least one pivotally mounted speed sensor weight attached to the shaft, said weight being pivotal about a weight axis transverse to the shaft axis, said weight including a flange engaging latch cooperative with the valve member flange, biasing means engaging and biasing the weight about the weight axis into engagement with the valve member flange to maintain the valve member in the open position; said weight also including a mass distributed radially from the shaft axis and radially movable in response to shaft rotation beyond a threshold value in opposition to the force of the biasing means thereby releasing the valve member by simultaneous disengagement of the latch from the flange and fluid flow force on the disc causing axial movement of the valve member to cover the fluid inlet, said weight having a first wing extending in one direction from the weight pivot axis and a second wing extending in the generally opposite direction from the weight pivot axis, the first wing including the latch and mass, the second wing being cooperative with the biasing means.

4,443,165

MOINEAU PUMP WITH HELICOIDAL COUPLING SLEEVE

Edmond Chanton, Clamart, France, assignor to Societe Generale de Mecanique et de Metallurgie, France

Filed Jan. 12, 1982, Ser. No. 338,833
Claims priority, application France, Jan. 19, 1981, 81 00904
Int. Cl.³ F04C *2/00, 15/00*; F16B *2/10, 7/04*
U.S. Cl. 418—48 **8 Claims**



1. In a Moineau gear pump comprising a stator having an axial cavity, a helicoidal rotor axially extending inside said cavity of the stator, and coupling means to couple the rotor to another driving or driven rotary member, the improvement wherein the helicoidal rotor projects axially out of said cavity of the stator and wherein the coupling means comprises a rigid and elongated coupling sleeve provided with an axial hollow whose shape is complementary to that of the helix of the rotor, said sleeve being engaged on and gripping the end of the rotor projecting from said cavity of the stator.

4,443,166

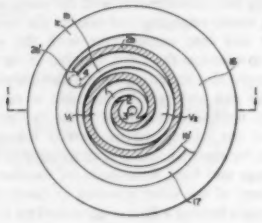
SCROLL FLUID APPARATUS WITH AN ARCUATE RECESS ADJACENT THE STATIONARY WRAP

Masato Ikegawa, Ibaraki; Kenji Tojo, and Masao Shibayashi, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 23, 1981, Ser. No. 314,459
Claims priority, application Japan, Oct. 27, 1980, 55-149402
Int. Cl.³ F01C *1/02, 21/00*
U.S. Cl. 418—55 **14 Claims**

1. A scroll fluid apparatus comprising: a first scroll member including an end plate and an upstanding wrap of vortical form located on a surface of said end plate, said wrap having a predetermined thickness and height, a second scroll member including an end plate and an upstanding wrap of vortical form located on a surface of said last-mentioned end plate, said wrap

of said second scroll member having a predetermined thickness and height, said second scroll member having an annular portion one with the end plate thereof and surrounding the wrap of said second scroll member, the first and second scroll members being disposed such that said annular portion contacts the end plate of said first scroll member and said first scroll member moves in orbiting motion with respect to said second scroll member, the annular portion of said second scroll member has a height corresponding to the height of the wrap thereof and is continguious at a surface thereof formed as a land with a surface of the wrap of the second scroll member for a circumferential extent of 180° from a terminating end of the wrap of the second member, said land having a strip-shaped recess defined on a radially outer side thereof by a section of the annular portion and on a radially inner side thereof by a portion of the wrap of the second scroll member, a depth of said recess is less than a height of the wrap of the second scroll member and said radially outer side of the recess is located at a predetermined distance from an outer wall surface of the wrap of the second scroll member, said recess communicating with a low pressure zone through an end portion thereof.



4,443,167

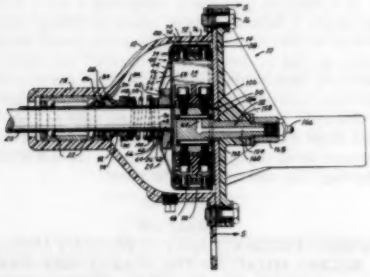
ROTARY FLUID PUMP MECHANISM

Sterling O. Stageberg, deceased, late of St. Petersburg, Fla., and Edward A. Linney, legal representative, 1513 4th Street North, St. Petersburg, Fla. 33704

Filed Aug. 20, 1981, Ser. No. 294,753

Int. Cl.³ F04C *5/00, 15/00*

U.S. Cl. 418—91 **25 Claims**



1. A fluid pump for pumping a fluid from an input conduit to an output conduit, comprising in combination:

a housing;

a cup-shaped rotor assembly rotatably disposed within said housing;

a rotatable vane ring assembly slidably disposed within said rotor assembly;

means for engaging said vane ring assembly within said rotor assembly to prevent said vane ring assembly from rotating within said rotor assembly;

a hub assembly disposed within said vane ring assembly;

means for positioning the axis of said hub assembly in a position parallel and eccentric to the axis of rotation of said vane ring assembly;

a wear plate in juxtaposition with the open end of said rotor assembly;

a plurality of band-shaped vanes interconnecting said vane ring assembly and said hub assembly;

said vanes being disposed in a spaced-apart relationship parallel to the axis of rotation of said vane ring assembly to form a plurality of pump chambers;

each of said pump chambers being defined by two said vanes, the bottom of said rotor assembly, and the inner surface of said wear plate whereby the volume of said pump chambers sequentially increase and decrease as said vane ring assembly is rotated;

an input port connected in fluid communication with said pump chambers when said pump chambers are increasing in volume as said vane ring assembly is rotated;

an output port connected in fluid communication with said pump chambers when said pump chambers are decreasing in volume as said vane ring assembly is rotated;

means for connecting said input port to the input conduit; and

means for connecting said output port to the output conduit.

4,443,168

GEAR MACHINE CENTERING ARRANGEMENT

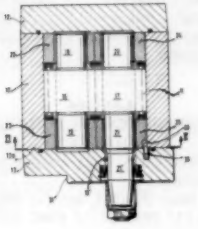
Wilhelm Dworak, Stuttgart; Martin Fader, Schoemberg; Claus Jöns, Sachsenheim; Siegfried Mayer; Karl-Heinz Müller, both of Vaihingen; Manfred Rasper, Leonberg; Dietrich Schuldt, Stuttgart; Wolfgang Talmon, Oetisheim, and Güenter Wolff, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

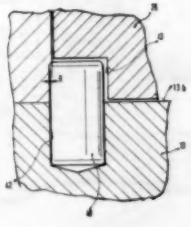
Filed Aug. 25, 1981, Ser. No. 296,183

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035663

Int. Cl.³ F01C *1/18, 21/10;* **F16B** *19/02*

U.S. Cl. 418—131 **7 Claims**





1. In a hydraulic gear machine, a combination comprising a hollow housing including a housing body having an inner surface bounding an internal chamber having at least one open end, and at least one end wall mounted on said housing body and having an end face which faces and closes said open end of said chamber in a mounting position of said end wall; meshing gear means in said chamber; and means for centering said end

wall in said mounting position thereof relative to said housing body, including at least four pins extending from said end face of said end wall into said open end of said chamber and engaging said inner surface at said open end in said mounting position, said four pins being so distributed that their outer surfaces define an imaginary figure of slightly larger dimensions than those of said inner surface of said housing body at said open end of said chamber so that said pins are fitted into said open end on assembly of said end wall with said housing body with attendant material displacement.

4,443,169

GEAR PUMP

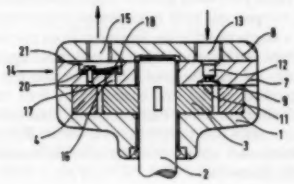
Johann Merz, Bopfingen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG, Friedrichshafen, Fed. Rep. of Germany

Filed Jan. 28, 1981, Ser. No. 229,067

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005657

Int. Cl.³ F04C *2/10, 15/04*

U.S. Cl. 418—171 5 Claims



1. A gear pump of the kind comprising a ring gear having therein an eccentrically mounted meshing driving gear wherein pressure pockets are cylically effected between meshing teeth varying in volume so as to progressively increase in volume at an inlet pressure zone and progressively decrease at an outlet pressure zone;

choke means at the inlet pressure zone through which fluid passes to said pressure pockets during increase of volume of said pressure pockets;

means effecting a plurality of outlet pressure passages communicatable with said pressure pockets at said outlet pressure zone and having check valves openable in response to pressure increase in said pressure pockets for flow through said outlet pressure passages during decrease in volume at said outlet pressure zone;

including a housing for said gears and means closing said housing comprising a member having said outlet pressure passages therethrough;

means providing a respective check valve for each said outlet pressure passage,

wherein said member is a cheek plate contiguous with the faces of said gears and said outlet passages comprise outlet pressure bores arcuately arrayed about the axis of rotation of said driving gear;

said cheek plate having a recess in said outlet pressure zone to effect a common outlet chamber communicating with said outlet pressure bores.

4,443,170

ARRANGEMENT AT OIL-INJECTED HIGH-PRESSURE SCREW COMPRESSOR

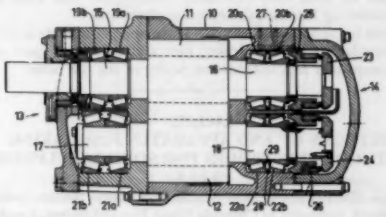
Lars L. B. Schibbye, Älgvägen, and Rolf A. Englund, Sandkullsvägen, both of Sweden, assignors to Sullair Technology AB, Stockholm, Sweden

Filed Nov. 24, 1982, Ser. No. 444,240

Claims priority, application Sweden, Nov. 25, 1981, 8107014

Int. Cl.³ F01C *1/16;* F03C *2/00;* F04C *29/02*

U.S. Cl. 418—203 7 Claims



1. An arrangement at oil-injected screw compressors for high pressures, characterized in that the length/diameter ratio of the rotors is lower than 1.3:1 in claim 1, that taper roller bearings in pairs are used at both shaft ends of the rotors, that the bearings at the high-pressure end of the rotors are arranged so that the wider edges of the inner rings of the bearings are facing toward each other and are capable to take up both radial and axial forces, that the bearings at the low-pressure end of the rotors are arranged so that the narrower edges of the inner rings of the bearings are facing toward each other and are capable to take up only radial forces, and that oil-pressure actuated balancing pistons are provided at the shaft ends on the low-pressure end of the rotors for taking up the major part of the axial forces initiated by the compressor.

4,443,171

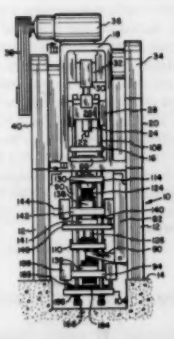
MULTI-MOTION MECHANICAL PRESS

James N. Dixon, DuBois, Pa., assignor to Wesjay, Inc., Greenville, Pa.

Filed Apr. 14, 1982, Ser. No. 368,110

Int. Cl.³ B29C *3/00;* B30B *11/02*

U.S. Cl. 425—78 22 Claims



1. In a press for consolidating powder into a useful article, said press having a support frame mounting an upper assembly including an upper ram slide having an upper punch mounted on a pitman connected to a crankshaft and driven by a bull gear, a die table having a fill cavity and a press bed, the improvement comprising:

a lower compaction and ejection assembly suspended from

the press bed by four hollow support posts, said assembly including:

an ejection plate;

at least one pressure plate below the press bed for supporting a lower ram connected to the depending ends of said support posts;

die plate support posts extending from said die plate through said hollow support posts and connected to a core rod plate at the lower ends thereof;

a lower ram having a punch and supported on said pressure plate;

a pair of push rods extending from upper ram slide and extending through the ejection plate; and

means for raising said ejection plate upon compaction of the powder to lift said lower ram and punch to eject said compacted article from the cavity of the die table.

4,443,172

METHODS OF AND APPARATUS FOR MAKING CATHODE ELECTRODES FOR SODIUM SULPHUR CELLS

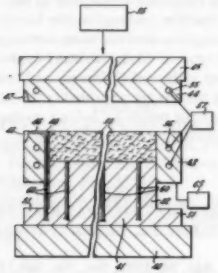
David J. Riley, Chester, and Gerald McGreavy, Bolton, both of England, assignors to Chloride Silent Power Limited, London, England

Filed Nov. 25, 1981, Ser. No. 324,922

Claims priority, application United Kingdom, Dec. 2, 1980, 8038627

Int. Cl.³ H01M *4/04*

U.S. Cl. 425—112 **15 Claims**



1. An apparatus for the manufacture of cathode structures for sodium sulphur cells comprising a closable mould for compressing a fibre matrix to the required shape of the structure, means for heating sulphur to a temperature above its melting point, temperature controlled injection means for injecting liquid sulphur into the mould containing the compressed matrix material and cooling means for maintaining the mould at a temperature of 12° C. or beow, said injection means having a temperature controller operative to maintain the sulphur temperature above the melting point but below 158° C. and furthermore including a temperature-controlled nozzle with heating means arranged to maintain the temperature of sulphur leaving the nozzle between 148° C. and 158° C., said nozzle having a shut-off valve.

4,443,173

MOLDING APPARATUS INCLUDING INSERT FEEDING MEANS

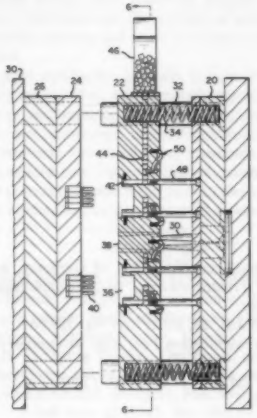
Robert L. Mansberger, II, Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 21, 1983, Ser. No. 477,055

Int. Cl.³ B29C *1/00*; B29D *3/00*; B29F *1/022*

U.S. Cl. 425—126 R **8 Claims**

1. In combination with a molding apparatus having first and second cavity mold plates, a back-up plate to support said first cavity mold plate, a top clamp plate adapted to drive the second cavity mold plate with respect to said first cavity mold plate, the mold plates together defining therebetween a plurality of mold cavities and including channels for flow of molding material from a central discharge point to each mold cavity, means to feed individual inserts into the mold cavities to be molded therein, said means comprising a plurality of feed tubes in said second cavity mold plate each opening into a respective one of said cavities at a position for an insert, a feed hopper at one end of said second cavity mold plate, a like plurality of feed tracks extending normal to the axis of a respective one of



said feed tubes providing gravity feed communication between said feed hopper said feed tube, means in each said feed track allowing a single insert to be dispensed from the feed track into the feed tube with each closure of said mold apparatus, and a like plurality of transfer pins secured to said top clamp plate each aligned to extend into a respective feed tube whereby relative closure motion of said top clamp plate and said second mold plate causes said transfer pins to move through said feed tubes driving said inserts into the correct location in the respective mold cavities.

4,443,174

PRESSING DEVICE FOR PRODUCING COMPACTS FROM SOURCE MATERIAL IN POWDER FORM, IN PARTICULAR PULVERIZED NUCLEAR REACTOR FUEL

Gerhard Heller, Hanau; Manfred Adelmann, Bruchköbel; Wilfried Wendorf, Hammersbach, and Wilhelm Königs, Rodenbach, all of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,180

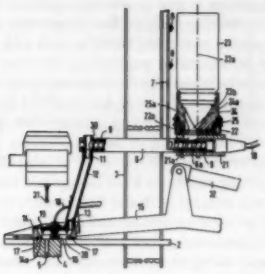
Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139150

Int. Cl.³ B30B *15/30*; B29C *3/04, 3/06*

U.S. Cl. 425—147 **7 Claims**

1. Pressing device for producing compacts from source material in powder form, in particular pulverized nuclear reactor fuel, comprising a die-plate contained in a platen and having a bore associated with a ram, for receiving source material powder, a filling shoe which is disposed at a movable arm, can be displaced over the platen, and applies against the platen, for filling source material powder into the die-plate bore, an outflow opening in the filling shoe directed toward the platen with a filling aid means, a hose connecting the filling shoe to a reservoir for source material powder provided with a metering means, the combination therewith of a passing wheel disposed in the outflow opening of the filling shoe as filling aid means, a tube in which is contained a feedscrew coaxial with the tube inserted between the hose and the reser-

voir as metering means, said reservoir comprising a bottom part with a can type place-on part and with an outflow bore of the can type place-on part leading to the tube with the feed-screw, a coupling part mounted at the opening of the can type place-on part, said coupling part having a passage bore leading to an opening in the can place-on part and disposed eccentric to the longitudinal axis of the can type place-on part, a cover



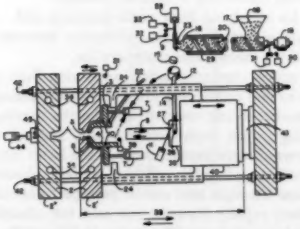
part associated with the coupling part and located between the bottom part and the coupling part, said cover part having a passage opening eccentric to the longitudinal axis of the can type place-on part, and said coupling part and said cover part rotatable relative to each other about the longitudinal axis of the can type place-on part into a position in which the passage bore in the coupling part, the passage opening in the cover part and the outflow bore in the bottom part are aligned.

4,443,175

APPARATUS AND METHOD FOR RUNNERLESS TRANSFER MOLDING OF THERMOSET COMPOUNDS

Robert H. Rose, 13850 Forest Grove Rd., Brookfield, Wis. 53005, and Allen J. Rose, W209 S6876 Stonecrest, Muskego, Wis. 53150

Filed Nov. 5, 1982, Ser. No. 439,420
Int. Cl.³ B29F *1/04, 1/08*
U.S. Cl. 425—208 **5 Claims**



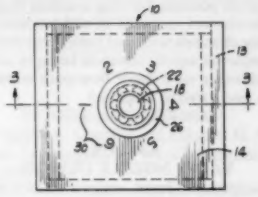
1. A runnerless transfer molding apparatus for thermoset molding comprising a reciprocating screw plasticizer and means to cut off a segment of plasticized compound extruded from said plasticizer, dropping said segment of plasticized compound in a transfer cup in an upright position, and means to tilt said cup to a horizontal position to deposit said plasticized compound in a horizontal cylinder, said cylinder being the feed chamber to the nozzle and gate of the die, said plasticized compound being forced through said nozzle and gate to the die by action of injection ram plunger.

4,443,176

FOOD MOLD

Nick Battistone, 25271 Chardon Rd., Richmond Heights, Ohio 44143

Filed Sep. 16, 1981, Ser. No. 302,795
Int. Cl.³ B29C *7/00*; A23G *9/04*
U.S. Cl. 425—276 **8 Claims**



1. A food molding and dislodging device comprising:

(a) an outer body structure, having sides and an upper mounting plate;

(b) a dislodging plate disposed within said outer body member in a plane parallel with the top of said mounting plate and movable upward and downward relative to the outer body member;

(c) a depth controller extending upward and above said mounting plate said depth controller having a plurality of grooves, each of said grooves being of differing length; and,

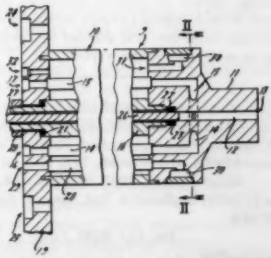
(d) a depth control selector in communication with the dislodging plate and wherein said depth control selector is rotatable around a central axis to selectively position said dislodging plate in communication with one of said grooves, the dislodging plate being positioned at a depth within the outer body member defined by the length of the groove in selected communication.

4,443,177

BACK FLUSH INJECTION NOZZLE

Bhaskar S. Modur, Canton; Uwe W. Perl, Union Lake, and Donald E. Smick, Berkley, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 6, 1983, Ser. No. 456,066
Int. Cl.³ B29F *1/03*; B29G *3/00*
U.S. Cl. 425—543 **12 Claims**



1. Injection apparatus adapted to supply thermosetting in-mold coating material into a molding cavity, which injection apparatus comprises:

a housing, the forward end of which comprises an outlet nozzle, an outlet channel extending through the outlet nozzle and the forward terminus of said outlet channel forming an outlet port;

first and second material supply channels, each extending within said housing from first and second supply inlet

ports in said housing, respectively, to a single common junction with said outlet channel; and

a shut-off rod slideably disposed within said outlet channel, being adapted to provide a sealing closure of said outlet port in a first, forward position and being retractable from the forward position to a second position in the outlet channel rearward of said junction of said material supply channels with said outlet channel and, in both the forward and retracted position, forming a sealing engagement with the outlet channel rearward of said junction of said material supply channels with said outlet channel; said first and second material supply channels being in communication with each other via a single flow-path when said shut-off rod is in said forward position.

4,443,178

VALVE NOZZLE DEVICES

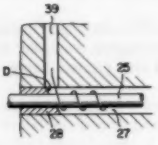
Shigeru Fujita, Numazu, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 402,853

Claims priority, application Japan, Jul. 30, 1981, 56-119685; Oct. 15, 1981, 56-164664; Oct. 15, 1981, 56-164665

Int. Cl.³ B29F *1/03*

U.S. Cl. 425—564 **8 Claims**



1. A valve nozzle device provided between a heating cylinder of an injection molding machine and at least one metal mold, and including at least one nozzle each controlled by a needle valve so as to inject a plastic resin melted in said heating cylinder into said metal mold, said device comprising first passage means connected to said heating cylinder for supplying said plastic resin melted in said heating cylinder therethrough, third passage means each provided in the form of a smooth cylinderical passage extending to envelope said needle valve so as to be merged into said nozzle, and second passage means interconnecting said first and third passage means, said second passage means having a central axis extending in a plane other than a plane including a central axis of said needle valve, said second passage means being connected with said third passage means in such a positional relation that said plastic resin in said second passage means flows into said third passage means from one side thereof following a helical path extending around said needle valve.

4,443,179

RAPID-ACTION MOLD CLOSER

Walter Wohlrab, Weissenburg, Fed. Rep. of Germany, assignor to Krauss-Maffei AG, Munich, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,235

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1981, 3107004

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—590 **10 Claims**

1. A mold-closing apparatus for an injection-molding machine having a movable mold-carrying plate, said apparatus comprising:

a fixed main cylinder;

a main piston connected to said plate and displaceable in said cylinder along a predetermined axis, said main piston forming in said cylinder a rear chamber and spaced axially toward said plate therefrom a front chamber, whereby pressurizing of said rear chamber with simultaneous depressurizing of said front chamber displaces said piston and plate forward to close a mold;

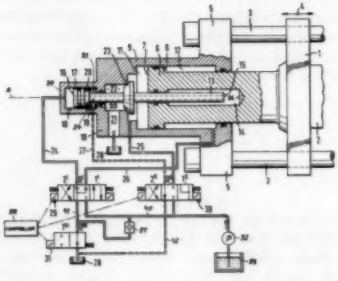
a rapid-action cylinder formed and extending axially in said main piston;

a rapid-action piston in said rapid-action cylinder and having an axially forwardly directed face forming therein a rapid-action chamber;

a positioning cylinder fixed on said main cylinder;

a positioning piston in said positioning cylinder and having therein a rearwardly directed face larger than said face of said rapid-action piston and forming with said positioning cylinder a pressurizable positioning chamber, said positioning piston being axially fixed on and integral with said rapid-action piston, said rapid-action piston being formed with a piston passage extending between and opening at its said face and at said face of said positioning piston, said main cylinder being formed with a large-diameter fill passage opening axially forward into its said rear chamber;

a valve element integral with and fixed axially to said rapid-action and positioning pistons and displaceable between a rear closed position engaged with and blocking off said fill passage and an open position forward therefrom and exposing said fill passage;



a fluid reservoir connected to said fill passage;

drive means for supplying fluid under pressure; and

control means including valves connected between said reservoir, drive means, and chambers for,

in a rapid-action closing position, supplying fluid under pressure to said positioning chamber while venting said front chamber to said reservoir and thereby moving said positioning piston, rapid-action piston, and valve element forward with displacement of the latter into said open position, whereby said rapid-action chamber is pressurized through said piston passage to move said main piston rapidly forward and said rear chamber is connected to said large fill passage to fill rapidly,

in a mold-closing position, supplying fluid under pressure to said rear chamber while venting said front and positioning chambers for moving said valve element back into said closed position, whereby said main piston is urged forward by pressure in said rear chamber, and

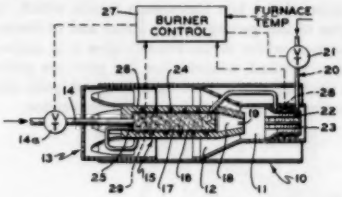
in a rapid-action opening position, supplying fluid under pressure to said front chamber while blocking flow out of said positioning chamber to move said element into said open position and vent said rear chamber through said fill passage into said reservoir.

4,443,180

VARIABLE FIRING RATE OIL BURNER USING AERATION THROTTLING

Richard T. LeFrois, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 11, 1981, Ser. No. 262,150
Int. Cl.³ F23N *1/00*
U.S. Cl. 431—4 **7 Claims**



1. A method for increasing the turndown ratio in a pressure atomizing liquid fuel burner comprising the steps of:

combining an amount of auxiliary gas with the liquid fuel prior to the atomization thereof in a generator/preheater in a manner which produces a substantially homogeneous foam;

atomizing said foam into a combustion chamber through a pressure-atomizing means; and

modulating the fuel consumption of the burner in response to temperature and pressure in said generator/preheater by controlling the auxiliary gas weight fraction in said foam such that the atomization pressure to said pressure-atomizing means remains substantially constant throughout the full turndown range of said burner.

4,443,181

DRAFT CONTROL SYSTEM

Robert J. Russell, 1332 Lymric Way, Bakersfield, Calif. 93309

Continuation-in-part of Ser. No. 124,089, Feb. 25, 1980, Pat. No. 4,341,344. This application Apr. 27, 1982, Ser. No. 372,326
Int. Cl.³ F23N *3/00, 5/00*
U.S. Cl. 431—6 **4 Claims**

4. A method for controlling uniform draft in a furnace having main and auxiliary draft control means mounted in an auxiliary channel in communication with the flue of said furnace, said furnace having burners with air regulators thereon, said method comprising the steps of:

setting the air regulators on the burners of said furnace in a 50% open position;

adjusting said auxiliary draft control means to an approximately half open position;

initially setting the main draft control means in an open position;

firing the furnace to begin combustion;

monitoring the amount of excess oxygen in the by-products of said combustion;

opening the air regulators on the burners of said furnace to provide the desired level of efficient excess oxygen; and

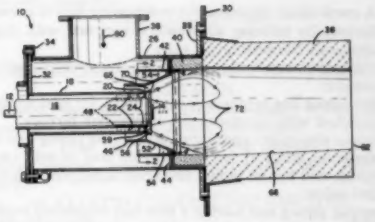
adjusting the position of said auxiliary draft control means in response to changes in operating conditions to assist said main draft control means in maintaining uniform draft conditions.

4,443,182

BURNER AND METHOD

Raymond J. Wojcieson, Annville, and Leonard G. Nowak, Palmyra, both of Pa., assignors to Hauck Manufacturing Company, Lebanon, Pa.

Filed Nov. 10, 1981, Ser. No. 320,007
Int. Cl.³ F23M *9/00*
U.S. Cl. 431—183 **19 Claims**



1. In an industrial burner having means for delivering fuel into a combustion chamber having a wall, a system for intermixing air, fuel and recirculating gases within the combustion chamber to provide a flame having substantially uniform combustion gas profiles of velocity and temperature at the combustion chamber exit, the system comprising:

a secondary air passage for the flow of secondary air surrounding the fuel delivering means and having an inner wall, an outer wall and means for dividing said secondary air passage into a plurality of separate flow passages to provide zones of relatively higher pressure secondary air flow forming along said dividing means adjacent relatively lower pressure secondary air flow within at least one of said flow passages;

a flow attachment wall connected to the outer wall of said secondary air passage and extending divergingly into the combustion chamber away from the axial centerline of said combustion chamber;

a secondary air chamber surrounding said secondary air passage at the entrance to said passage for providing secondary air to said secondary air passage in a direction non-parallel to the longitudinal axis of said secondary air passage and each said secondary air passage dividing means;

a secondary air inlet means for supplying secondary air to said secondary air chamber;

said secondary air chamber being connected between said inlet means and said secondary air passage;

deflector means connected to the end of said secondary air passage inner wall downstream of said dividing means for promoting attachment of said secondary air flow along said flow attachment wall and for providing a boundary between regions of different pressures adjacent said deflector means in the combustion chamber to promote generation of vortexes by the interaction of the zones of high-pressure secondary air flow with the fuel and recirculating gases.

4,443,183
COMBUSTION APPARATUS

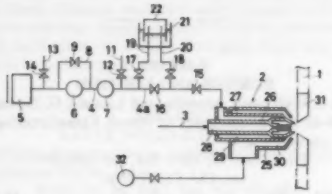
Shoji Shimizu, and Hiroyuki Mitsudomi, both of Osaka, Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Jul. 21, 1982, Ser. No. 400,289

Claims priority, application Japan, Jul. 21, 1981, 56-108997[U]; Sep. 14, 1981, 56-145340; Sep. 14, 1981, 56-145342

Int. Cl.³ F23D *13/40*

U.S. Cl. 431—354 **3 Claims**



1. A combustion apparatus for combusting fuel in a combustion furnace by utilizing air which is enriched with oxygen, said apparatus comprising:

an oxygen permselective membrane for enriching air with oxygen;

a first piping line having a vacuum pump for feeding said air enriched with oxygen to the combustion furnace;

a bypass piping line connected to said first piping line at the upstream side and the downstream side of said vacuum pump, said bypass piping line being equipped with a control valve;

a second piping line having a first end connected with said first piping line between said vacuum pump and said oxygen permselective membrane and a second end open to the atmosphere, said second piping line being equipped with a control valve; and

a third piping line having a first end connected with said first piping line between said vacuum pump and the combustion furnace and a second end open to the atmosphere, said third piping line being equipped with a control valve.

4,443,184
PROCESS AND APPARATUS FOR IGNITING A SINTER MIX

Horst Bonnekamp, Düsseldorf; Baldur Sauer, Krefeld; Heinrich Wolkewitz, Duisburg; Günter Hepp, Oberhausen, and Walter Kraemer, Nuess, all of Fed. Rep. of Germany, assignors to Wistra GmbH Thermoprozesstechnik, Düsseldorf-Heerdt, Fed. Rep. of Germany

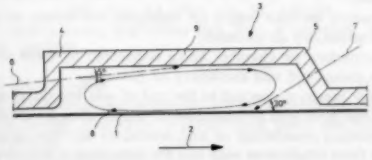
PCT No. PCT/DE81/00047, 371 Date Nov. 23, 1981, 102(e) Date Nov. 23, 1981, PCT Pub. No. WO81/02747, PCT Pub. Date Oct. 1, 1981

PCT Filed Mar. 20, 1981, Ser. No. 328,596

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 3010844; Mar. 21, 1980, 3010845

Int. Cl.³ F27B *14/00, 9/26;* **C22B** *1/16;* **C21B** *7/16*

U.S. Cl. 432—13 **20 Claims**



1. Process for igniting a sintering mix consisted of a solid fuel and a sinter material, especially a sinter smelting mixture, in a sintering machine having an igniting kiln having two closed end walls, side walls and a closed roof, comprising the steps of providing in the kiln a first group of burners which operate approximately stoichiometrically and providing in the kiln a second group of burners, passing a sintering mix underneath the igniting kiln substantially horizontally from an inlet end wall to an outlet end wall; and introducing into an upper region of the kiln flue gases from said first group of burners and introducing from said second group of burners flue gases with an increased oxygen content into a lower region of the kiln in such a manner that a kiln atmosphere results which, in the upper region of the igniting kiln, is hotter and of diminished oxygen content, whilst in the lower region it is cooler and more oxygen-enriched, whereby hot flue gases are generated above the sintering mix and are heated up and ignite the surface of the sintering mix by radiation and convection.

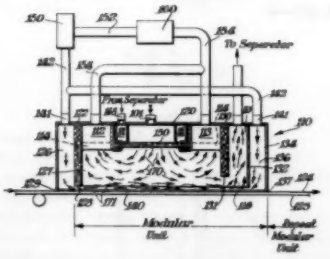
4,443,185
HEATING OF WEBS

Thomas M. Smith, 1415 Golf Rd., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 292,167, Aug. 11, 1981, and a continuation-in-part of Ser. No. 279,081, Jun. 30, 1981, and a continuation-in-part of Ser. No. 238,418, Feb. 26, 1981, and a continuation-in-part of Ser. No. 186,491, Sep. 12, 1980, Pat. No. 4,378,207, and a continuation-in-part of Ser. No. 178,121, Aug. 14, 1980, Pat. No. 4,373,904, and a continuation-in-part of Ser. No. 952,332, Oct. 18, 1978, Pat. No. 4,326,843, said Ser. No. 238,418, Ser. No. 186,491, and Ser. No. 178,121, each is a continuation-in-part of Ser. No. 94,901, Nov. 16, 1979, Pat. No. 4,272,238, and Ser. No. 20,079, Mar. 13, 1979, Pat. No. 4,290,746. This application Oct. 19, 1981, Ser. No. 312,730

Int. Cl.³ F27B *9/28*

U.S. Cl. 432—59 **14 Claims**

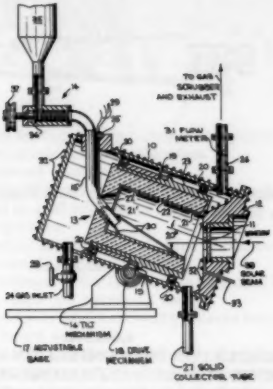


1. A heating apparatus for heat-treating an elongated porous web of material as it is carried in a continuous manner through a heat-treating station, said apparatus including an endless porous conveyor belt threaded through that station and having an upper run to carry the web through the station, at least one gas-fired burner facing downwardly over said upper run, having the lower ends of its gas flames spaced not more than about five inches from the upper run, and extending approximately over the entire width of that run as well as over much of its length to heat the porous web, and at least one suction box under the upper run and having a suction mouth positioned to suck through the porous web and porous belt the hot combusted gases discharging from the burners, the mouth being located essentially entirely beyond but adjacent the flames so that the hot sucked-in gases are diluted with ambient cooler gas.

4,443,186
SOLAR HEATED ROTARY KILN

Pamela K. Shell, Tracy, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1982, Ser. No. 368,198
Int. Cl.³ F27B *7/00, 6/08;* **F26B** *19/00*
U.S. Cl. 432—103 **19 Claims**



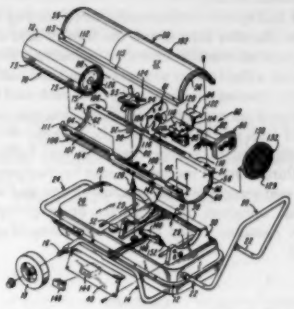
1. A solar heated rotary kiln for decomposing material comprising:
- a sealed container having a window therein for admitting solar energy therethrough,
- a kiln rotatably mounted entirely within said sealed container,
- said kiln being of a substantially cylindrical configuration and having one end fully open and aligned with said window such that solar energy passing through said window is directed only into said fully open one end of said kiln,
- said kiln including an inner layer, a layer of insulation, and an outer wall,
- means for directing material to be decomposed into said kiln through a partially closed end thereof located opposite said open end,
- means for rotating said kiln,
- means for exhausting gas from said sealed container, and
- means located adjacent said fully open end of said kiln for collecting solids passing through said kiln.

4,443,187
PORTABLE HEATER WITH INTEGRATED CONTROL SYSTEM

Robert S. Shaftner; Norman D. Chambers; Michael A. Kagan, and Eugene C. Briggs, all of Bowling Green, Ky., assignors to Koehring Company, Brookfield, Wis.

Filed Jun. 4, 1982, Ser. No. 384,868
Int. Cl.³ F24H *1/00;* **H01B** *7/34*
U.S. Cl. 432—222 **13 Claims**

5. A portable space heater comprising a housing constructed for a flow of air therethrough from an entry end to a discharge end, means defining a combustion chamber in said housing, heater operating elements including energizable means for compelling a flow of air through said housing and electrical controls for said operating means, means defining a protected compartment external to said housing and said housing having an opening in an area adjacent to said entry end thereof communicating the interiors of said housing and said compartment and said electrical controls including circuit board means in said compartment embodying in connection therewith the essential wiring and connections for directing power to and controlling the operation of said operating elements, the construction and arrangement utilizing the relatively remote location of the circuit board means and the cooling effect of incoming air at the entry end of said housing to insulate said circuit

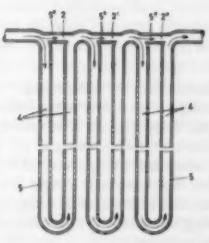


board means from the heat of combustion generated in said combustion chamber.

4,443,188
LIQUID COOLING ARRANGEMENT FOR INDUSTRIAL FURNACES

Karl Bühler, Nussbaumen, Switzerland, assignor to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Apr. 6, 1982, Ser. No. 366,089
Claims priority, application Switzerland, May 20, 1981, 32808/81
Int. Cl.³ F27D *1/12;* **C21C** *1/00;* **F28F** *21/02*
U.S. Cl. 432—233 **14 Claims**



4. In an industrial furnace having thermally highly stressed parts including furnace walls, cover frames; door frames and gas removal nozzles, a liquid cooling system for said thermally highly stress parts, said system comprising:
- first flow means defining at least two pairs of first and second substantially vertical cooling channels having top and bottom ends;
- first conduit means connecting the bottom ends of said first and second channels for providing flow communication therebetween;
- second by-pass conduit means connecting the top ends of said first and second cooling channels of each said channel pair;
- inlet means providing cooling fluid flow to the top of said first channel of one said channel pair;
- third conduit means providing fluid flow between the tops of first and second channels of adjacent channel pairs; and
- outlet means providing fluid outflow from the top of said second channel of a channel pair,
- whereby cooling fluid from said inlet means and said third conduit means divides so as to flow into said first channel of one said channel pair, and to flow into said second conduit means thereby by-passing said channels, and

whereby said fluid from said channels and said by-passed fluid mix in a succeeding said third conduit means and in said outlet means,

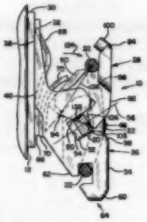
wherein said system further comprises a cooling liquid distribution chamber into which the tops of said channels extend, said distribution chamber including a fluid inlet at a first end, a fluid outlet at a second end and baffles defining by-pass openings at the top thereof, each said baffle being positioned between the tops of said first and second channels of each said pair of channels, whereby the portions of said distribution chamber between said baffles comprise said third conduit means and said by-pass openings comprise said second by-pass conduit means, and wherein said by-pass openings define, singly or in groups, stepwise larger passages in the direction of flow of said cooling liquid.

4,443,189

MULTI-PURPOSE ORTHODONTIC BRACKET

Alexander J. Wildman, 2440 Willamette St., Eugene, Oreg. 97405

Filed Oct. 15, 1982, Ser. No. 434,494
Int. Cl.³ A01C *7/00*
U.S. Cl. 433—10 **23 Claims**



1. An orthodontic bracket comprising:

a body including a base, a first wing, and an arch wire slot in a side of the body remote from the base and extending generally normally to the wing;

slot closure means including a second wing directed oppositely of the first wing and a rigid closure member integrally connected to the second wing and directed toward the first wing and adapted to be moved into and out of a slot-closing position;

articulation means interconnecting the closure means and the body for relative movement of said closure member between a slot-open and a slot-closing position; and

means on said wings for receiving an elastic element to apply a bias to said closure means to urge the rigid closure member to the slot-closing position to rigidly secure an arch wire in the bracket.

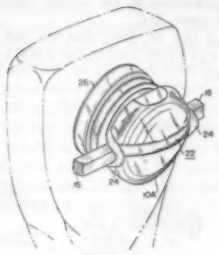
4,443,190

THERMOPLASTIC ORTHODONTIC ARCH WIRE RETAINING ANNULAR LIGATURE AND PROCESS

Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Continuation-in-part of Ser. No. 316,880, Oct. 30, 1981, abandoned. This application Jan. 21, 1982, Ser. No. 341,515
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—15 **1 Claim**

1. A process for applying an annular thermoplastic ligature to an orthodontic appliance to hold an orthodontic arch wire firmly on the appliance and which comprises the steps of: heating the thermoplastic material to a softened state, stretching the material and allowing the material to cool while maintaining it in its stretched state; forming a ligature out of the thermoplastic material; applying the ligature to the appliance and around the arch wire; heating the ligature to a temperature at which the ligature assumes a shrunken state; and allowing



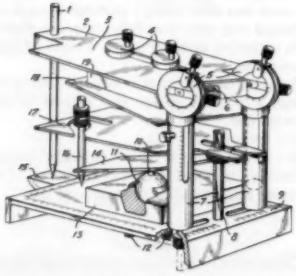
the ligature to cool in its shrunken state firmly to hold the arch wire on the appliance.

4,443,191

APPARATUS FOR THE CONFECTION OF MAXILLAR MODELS THROUGH CEPHALOMETIC ANALYSIS

Antonio M. Gutierrez, Havana, Cuba, assignor to Empresa Cubana Exportadora E Importadora de Productos Medicos, Havana, Cuba

Continuation of Ser. No. 184,071, Sep. 4, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,033
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—56 **8 Claims**

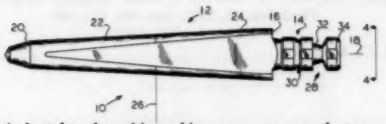


1. An apparatus for the production of maxillary and jawbone models from teleradiographics with all of their corresponding osseous and anatomical form and structure including their dimensional relationships through cephalometric analysis comprising: a single base; a pair of towers extending from said single base, said towers being set with condylar means for supporting an upper section; said upper section being provided with condylar movements; said base and said upper section being adapted to support mandibular and palatal plates and their respectively connected sliding ball joint platforms, said platforms which support said models; an occlusal plate is disposed between said mandibular and palatal plates and is positioned over first and second rods; said first rod supporting one end of said occlusal plate and being disposed between said pair of towers, and said second rod supporting the other end of said occlusal plate being disposed at said other end of said occlusal plate opposite said first rod; where cephalometric angles, planes and points may by transferred to said apparatus by means of an articulated cephalometric ruler.

4,443,192
DOWEL PINS

Herman Blitz, P.O. 925 Harbor Lake Ct., Safety Harbor, Fla. 33572

Filed May 24, 1982, Ser. No. 381,542
Int. Cl.³ A61C 19/00
U.S. Cl. 433—74 4 Claims



1. A dental tool used in making a crown on a plaster model, wherein said tool comprises, in combination,
an elongate, tapered shank portion,
a barbed portion integrally formed with said shank portion and disposed in axial alignment therewith,
a plaster base member,
said shank portion of said tool embedded in said base member, and releasably engaged therewith,
a crown model means of the type used in preparing a crown that will be fitted into a patient's mouth,
said barbed portion of said tool fixedly secured interiorly of said crown model means,
said barbed portion including a plurality of axially spaced barb members of generally disc-like configuration,
said barb members interconnected by link members,
said link members having a diameter less than the respective diameters of said barb members,
a flat means formed on each of said plurality of barbed members and on said shank portion to provide rotational stability between said barbed members and said crown model means and between said shank portion and said base portion,
said flat means including a plurality of flat surfaces formed on said barb members and said shank portion,
and said flat surfaces disposed in a common plane parallel to but offset from the longitudinal axis of symmetry of said tool.

4,443,193
ENDODONTIC INSTRUMENT

James B. Roane, 707 SW. 24th St., Norman, Okla. 73069

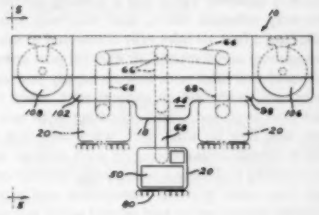
Filed Feb. 8, 1983, Ser. No. 464,972
Int. Cl.³ A61C 5/04
U.S. Cl. 433—102 28 Claims

1. An endodontic instrument, comprising:
a tapered working portion defined on a flexible shaft, said working portion including a plurality of spiral rotationally bi-directional cutting edges thereon; and
a tapered tip defined on said flexible shaft and intersecting an end of each of said cutting edges of said working portion, said tapered tip having a greater angle of taper than said tapered working portion, said tapered tip being shaped such that sharp cutting points which are normally present at an intersection between said ends of each of said cutting edges and a standard 75° included angle conically tapered tip are substantially eliminated so that lateral transportation of said instrument when cutting a curved root canal is reduced as compared to an otherwise similar instrument having a standard 75° included angle conically tapered tip intersecting said ends of said cutting edges.

4,443,194
DENTAL OPERATING UNIT WITH REVERSIBLE DENTAL ASSISTANT'S UNIT

John R. Fuchs, Louisville, Ky., assignor to Robert J. Fuchs, Louisville, Ky.

Filed Jun. 28, 1982, Ser. No. 392,853
Int. Cl.³ A61G 1/14, 15/00
U.S. Cl. 433—79 6 Claims



1. A dental operating unit adapted for rear delivery use adjacent the head of a reclining patient's chair, said unit comprising:
a. a dentist's dynamic instrument service cabinet located at the rear of the patient's head and is accessible to the dentist as he operates from either side of the chair, said cabinet being provided with an elevated elongated counter top that extends for at least the width of the service cabinet on each side thereof thereby leaving a gap between the top of the cabinet and the underside of the counter top;
b. a reversible dental assistant's unit comprising an instrument tray and a plurality of dynamic instruments arranged on the side of the tray, said unit being supplied with one or more of the following utilities: electrical cable means, vacuum conduit means, water conduit means, and a compressed air conduit means for supplying the instruments of the assistant's unit, said unit being adapted for positioning either to the left front or the right front of the said dentist's dynamic instrument service cabinet;
c. and a pivoted bracket arm means located in the said gap between the counter top and the dynamic instrument service cabinet for swinging movement in a horizontal plane and supporting the said dental assistant's unit;
d. whereby the dental assistant's unit may be shifted anywhere between its left side and right side positions so that the dental assistant may function successfully from either side of the patient's chair, while the pivoted bracket arm means is hidden under the counter top.

4,443,195
DRIVING AND WATER POURING CONTROL DEVICE FOR DENTAL AIR-TURBINE HANDPIECE

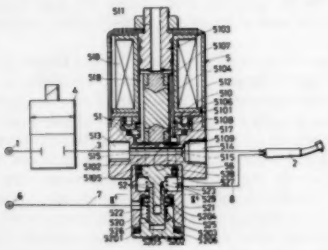
Takahiro Matsui, Uji, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed May 20, 1981, Ser. No. 265,379
Claims priority, application Japan, May 22, 1980, 55-71100[U]; May 29, 1980, 55-74923[U]
Int. Cl.³ A61C 1/08
U.S. Cl. 433—84 4 Claims

1. A device for controlling driving and water pouring of a dental air-turbine handpiece, said device comprising an air supply on-and-off valve means and a water pouring on-and-off

valve means disposed in an air supply passageway connecting a compressed air source to said handpiece, a first water pouring passageway connecting said water pouring valve means to a water source, and a second water pouring passageway connecting said handpiece to said water pouring valve means, said water pouring valve means including a valve control unit and a valve operating unit, said valve control unit, when in its inoperative state, communicating with the atmosphere through a first exhaust port to thereby close said valve operating unit, but said valve control unit, when in its operative state, closing said first air exhaust port and introducing part of said compressed air from said air supply passageway to the inside thereof to thereby open said valve operating unit so as to establish communication between said first and second water pouring passageways and wherein said water pouring on-and-off valve means comprises:

a four-way solenoid valve and a housing connected to said four-way solenoid valve, said four-way solenoid valve including a first air inlet port connected to said air supply passageway and a second air exhaust port communicating with said first inlet port, first air supply port and said first air exhaust port, said air exhaust port, when said first air inlet port is closed, communicating with said air supply port, said first air inlet port, when said first air exhaust port is closed, communicating with said air supply port, said housing including a water inlet chamber connected to said first water pouring passageway and a water outlet chamber connected to said second water pouring passageway, said water inlet and outlet chambers both communi-



cating with each other through a valve port, said port having a valve rod passing therethrough, said valve rod having a valve body fixed thereto and adapted to close said valve port, said water outlet chamber incorporating thereinto a piston, said piston being normally pressed against the abutment surface of said solenoid valve and being moved toward said valve rod by compressed air supplied from said air supply port of said solenoid valve and thereafter being driven to further press against said valve rod so as to open the valve port closed by said valve body; and

wherein said air supply on-and-off valve means further comprises:

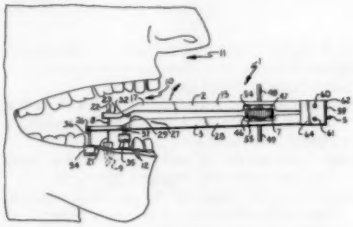
an air inlet port at the lower end thereof, said housing of said water pouring on-and-off valve means projecting downwardly of a valve controlling unit, the air exhaust side of said air supply on-and-off valve means being connected by a connecting pipe to the air inlet port of said water pouring on-and-off valve means, a support member including a first hole for watertightly receiving said housing thereinto and a second hole for airtightly receiving said air inlet port thereinto, a water introduction pipe and a water discharge pipe communicating with said first hole, and an air supply pipe communicating with said second hole which is disposed on a lower side of said water pouring and air supply on-and-off valve means, said housing and said air inlet port resting in said first and second holes respectively and said pouring passageway and said air supply passageway being respectively connected to said water introduction pipe and to said air supply pipe.

4,443,196

TOOTH ROOT EXTRACTOR

Miguel Rico, 3406 W. 43th St., Shawnee Mission, Kans. 66205

Filed Sep. 20, 1982, Ser. No. 420,308
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—158 **11 Claims**



1. A dental device having an operational position for extracting a tooth root from surrounding oral cavity structure; said device comprising:

(a) first and second elongate arms connected together;

(b) holding means positioned along said first arm near a free end thereof and adapted to operably retain a tooth root screw device secured in a tooth root;

(c) engaging means on said second arm for bearing on the oral cavity structure surrounding the tooth rooth in such a manner as not to bear on the tooth root to be extracted; and

(d) spreader means spaced from said holding means; said spreader means being connected to and selectively urging said first and second arms into a spaced vertical relationship at said holding means under controlled manipulation; said spreader means positioned exteriorly of the oral cavity when said dental device is in the operational position thereof.

4,443,197

VARNISH FOR PROTECTING A TOOTH SURFACE

Takeo Fusayama, Tokyo, and Junichi Yamauchi, Kurashiki, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 3, 1983, Ser. No. 471,849
Claims priority, application Japan, Mar. 12, 1982, 57-39694
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—217 **11 Claims**

1. A method for restoring a carious tooth and protecting healthy tooth surfaces against erosion by an acid etching solution, which comprises:

(i) applying a polymer solution to the tooth surface, and evaporating the solvent from said solution to form a polymer coating on the surface;

(ii) removing the carious portion of the tooth by drilling;

(iii) applying an acid etching agent to the walls of the tooth cavity from which the carious material has been removed;

(iv) thereafter, filling the tooth cavity with a dental filling material; and

(v) removing the polymer coating from the healthy tooth surfaces.

4,443,198

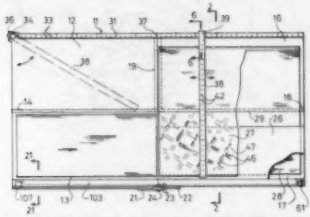
FOLDING BOARD FOR PAMPHLETS, MAPS AND THE LIKE

Kamran Ehsanipour, 212 Stanley Rd., Burlingame, Calif. 94010

Continuation-in-part of Ser. No. 170,136, Jul. 18, 1980, Pat. No. 4,360,346. This application Apr. 2, 1982, Ser. No. 364,769

Int. Cl.[3] G09B *29/10*

U.S. Cl. 434—153 16 Claims



1. A folding board comprising at least four rectangular sections, first hinge means connecting a first and second said section along a first line, said first hinge means being of a type to permit front faces of said first and second sections to fit flat against each other in folded position, second hinge means connecting a third and a fourth said section along a second line which is an extension of said first line, said second hinge means being of a type to permit front faces of said third and fourth sections to fit flat against each other in folded position, third hinge means connecting said first and third sections together along a third line transverse a said first and second lines and intersecting the junction of said first and second lines, said third hinge means being of a type to permit the back faces of said first and third sections to fit against each other, and fourth hinge means connecting said second and fourth sections along a fourth line which is an extension of said third line, said fourth hinge means having a hinge axis spaced above the plane of said second and fourth sections a distance at least twice the thickness of said board.

4,443,199

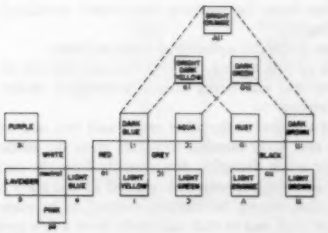
METHOD OF TEACHING THE PRONOUNCIATION AND SPELLING AND DISTINGUISHING BETWEEN THE WRITTEN AND SPOKEN FORM OF ANY LANGUAGE

Margaret Sakai, 8 Loddon Ct., Clayton South, Victoria 3169, Australia

Filed May 18, 1982, Ser. No. 379,473

Int. Cl.[3] G09B *1/32*

U.S. Cl. 434—170 24 Claims



1. A method of teaching the pronounciation and spelling and distinguishing between the written and spoken form of any language, the method comprising: A. utilizing three sets of tiles which consist essentially of: (1) a first set denoting alphabet letters, (2) a second set denoting phonetic vowels, (3) a third set denoting phonetic consonants, said first set comprising all geometrically uniform tiles, each said geometrically uniform tile having an alphabet letter on one surface thereof in black or white and a background of opposite white or black colour to the letter colours, there being a separate tile for each upper case alphabet letter and a separate tile for each lower case alphabet letter, said second set of tiles comprising geometrically uniform tiles wherein one surface of each tile is blank and is individually and distinctively coloured to represent a phonetic vowel spelling where there are differences in spelling the same vowel sound, while the other surface of each tile contains a phonetic symbol to represent the vowel sound of said one surface, the said third set of tiles comprising single letter consonants and two-letter digraph combinations of consonants having a single phonetic sound: B. selecting the first, second and third sets to be distinct, and C. teaching the pronounciation and spelling of words of said any language by interposing said alphabet tiles and said phonetic tiles.

4,443,200

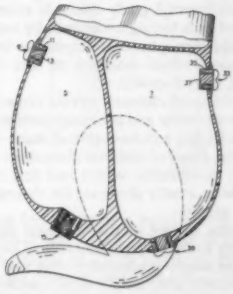
TOILET TRAINING DEVICE

Judith K. Murphy, 58 Norwood Ave., Albany, N.Y. 12208

Filed Aug. 8, 1983, Ser. No. 521,093

Int. Cl.[3] G09B *19/00*

U.S. Cl. 434—247 3 Claims



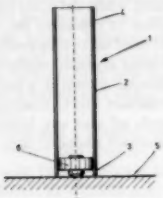
1. A toilet training device for toilet training of children, said toilet training device having an anterior chamber and a posterior chamber, said anterior chamber holding water and said posterior chamber hold soft material, said anterior chamber having an upper access port for filling said anterior chamber with water, said posterior chamber having an access port for filling said posterior chamber with such soft material, each of said upper access ports comprising a tapped port body and a threaded plug with said threaded plug being removably engaged with said tapped port body, said chamber having means to allow such water representing urine to pass from said anterior chamber upon sufficient pressure being applied to said anterior chamber holding such water, said posterior chamber having means to allow such soft material representing stools to pass from said posterior chamber upon sufficient pressure being applied to said posterior chamber, said means to allow such water representing urine to pass from said anterior chamber upon sufficient pressure being applied to said anterior chamber holding such water comprising a lower valve, said lower valve comprising a valve port, ball and compression spring, said spring biasing said ball into seating relationship with said valve port to close said valve, and said valve opening to allow water to pass therethrough by said ball moving away from said valve port against the biasing force of said spring upon sufficient pressure being applied to said anterior chamber.

4,443,201

SHAPE ASSOCIATION SOUND-EMITTING TOY

Berndt Diefenbach, Würmstrasse 8, Percha D-8136, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,474
Int. Cl.³ G09B 1/06; A63H 5/00
U.S. Cl. 434—259 **4 Claims**



1. A sound-emitting toy, comprising in combination:

a support base;

first and second vertically elongated pipes positioned on and projecting vertically upwardly from said base in sidewardly spaced relationship, said pipes being of substantial vertical height, and said vertical height being several times greater than the horizontal cross-sectional dimension of the pipes;

each of said first and second pipes respectively having first and second internal guide channels extending vertically thereof and each having a substantially constant cross-sectional shape throughout its respective length, each said guide channel when mounted on said base having the lower end thereof closed;

said first and second channels having cross-sectional shapes which are dissimilar and noncompatible with one another;

a first piston having a cross-sectional shape which conforms solely to the shape of said first channel so as to be slidably but snugly positionable within said first channel so as to slidably move axially downwardly therealong due to the urging of gravity;

a second piston having a cross-sectional shape which conforms solely to the shape of said second channel so as to be slidably but snugly positionable with said second channel so as to slidably move axially downwardly therealong due to the urging of gravity;

each of said first and second pistons having a height which is only a small fraction of the vertical height of its respective pipe; and

each of said first and second pistons having an opening extending axially therethrough and a sound-emitting means positioned within said opening for generating a sound in response to flow of air therethrough as said piston slidably moves downwardly within its respective channel due to the force of gravity.

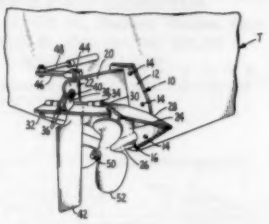
4,443,202

SURFACE PROPELLER MOUNTING ASSEMBLY FOR BOATS

Daniel J. Arena, 3334 St. Marys Rd., Lafayette, Calif. 94549

Filed May 29, 1981, Ser. No. 268,493
Int. Cl.³ B63H 5/14
U.S. Cl. 440—51 **14 Claims**

1. A unitary assembly for mounting a surface prop on the transom of a boat hull in a position wherein, when the hull is planing on the surface of a body of water, the prop intersects the surface to the rear of the hull, said assembly comprising: a mounting plate adapted to be fixedly secured to the transom; a vertically extending prop shaft support fixed to the plate for juxtaposition against the transom upon securing the plate to the transom, said support carrying prop shaft bearing means to rotatably support a prop shaft extending through the transom, said vertically extending prop shaft support including a web-like portion extending below said prop shaft; a rudder support arm fixed to the plate and extending rearwardly therefrom above the prop shaft support, said arm carrying a rudder bearing; and, a hood carried by said plate and extending rearwardly therefrom so as to extend over and partially around the top of a prop carried by said prop shaft supported by said bearing means, said hood having a forward end intersecting the plate at



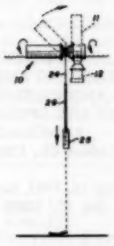
a juncture above the shaft support, wherein the hood extends from the plate and has an undersurface of a generally concave configuration transverse to the longitudinal axis of said prop shaft so as to define a water channel above said prop when the hull upon which the assembly is mounted is supported in a non-planing start-up condition on the surface of a body of water.

4,443,203

FLOATING MARKER

Gregory E. Maertens, 8356-79th St., Cottage Grove, Minn. 55016

Filed Feb. 1, 1982, Ser. No. 344,392
Int. Cl.³ B63B 21/52
U.S. Cl. 441—22 **6 Claims**



1. A marker bouy for marking underwater locations, said bouy including:

a. a hollow, generally cylindrical body member;

b. a length of line having one end thereof attached to said body member and being normally wrapped about said body member;

c. a weight attached to the other end of said line, said weight causing said body member to rotate upon the surface of the water when dropping downwardly from the surface;

d. a water admitting aperture on one end of said body member to admit water interiorally thereof to increase the weight of such end to shift said body from a first position of lying on the water surface to a second position of being vertical in the water;

e. a radially extending flange arranged on the end of said body having said aperture;

f. a line trapping member defined within said flange; and,

g. at least one vane member extending radially outwardly from said body and arranged longitudinally thereof adja-

cent said flange to normally slow the rotation of the marker.

4,443,204

HYDRO-THERAPY APPARATUS

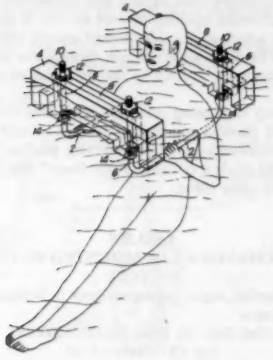
Arden Perrin, 15 Boulevard Louis II, Monte Carlo, Monaco

Filed Jan. 6, 1982, Ser. No. 337,390

Claims priority, application United Kingdom, Jul. 24, 1981, 8122905

Int. Cl.³ B63B 35/00

U.S. Cl. 441—129 7 Claims



1. Hydrotherapy apparatus for supporting a patient in a body of water comprising a pair of flotation bodies, a pair of parallel bars extending substantially horizontally between the flotation bodies and having vertically oriented end portions extending upwardly through the flotation bodies such that a patient may be supported in a generally vertical position in the body of water by the parallel bars disposed under the armpits of the patient and with the flotation bodies being disposed in front of and behind the patient and adjustable means for securing said bars to said flotation bodies whereby the spacing between said bars is adjustable to position the bars under the armpits so that the patient may be supported in the body of water between the flotation bodies.

4,443,205

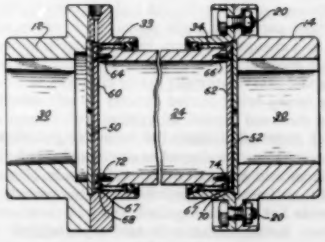
GEAR TYPE SHAFT COUPLING

George G. Grant, Mishawaka, Ind., assignor to Reliance Electric Co., Mishawaka, Ind.

Filed Jul. 6, 1981, Ser. No. 280,462

Int. Cl.³ F16D 3/18

U.S. Cl. 464—16 9 Claims



1. A gear coupling for connecting two shafts in end-to-end relation, comprising hubs for mounting on each of the shafts, sleeves secured to said hubs in axial alignment therewith and extending from the hubs towards one another, said sleeves having internal gear teeth, a tubular shaped spacer extending between said sleeves and having external gear teeth near the ends thereof for meshing with the gear teeth in said sleeves, means for minimizing end play between said spacer and said hubs, including a separate plate on the inner end of each of said hubs, an annular shoulder on each of said sleeves on the outboard side of the teeth of said sleeves and in close proximity to the respective hub, and a radially outwardly extending flange on each end of said spacer between the respective end plate and said annular shoulder for engaging the respective shoulder on the outboard side thereof.

4,443,206

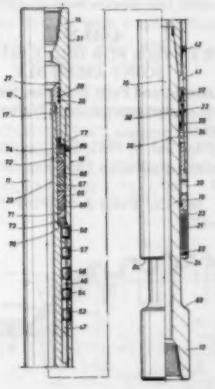
WELL TOOL

Chuan C. Teng, Houston, Tex., assignor to Dailey, Inc., Houston, Tex.

Filed Feb. 5, 1982, Ser. No. 346,169

Int. Cl.³ E21B 17/07; F16D 3/06

U.S. Cl. 464—20 10 Claims



1. A well tool for maintaining bottom hole contact while absorbing angularly and axially directed shock forces of a rotating drill bit carried on a drill string comprising:

(a) an elongated body having threaded connections at its ends for assembly into a string of well pipe carrying a drill bit, said body having an axial flow passageway;

(b) said body formed of a tubular mandrel slideably mounted within a tubular barrel with an annulus exposed to well fluid between said mandrel and said barrel;

(c) fluid seals positioned in the annulus between said mandrel and said barrel forming an annular region isolated from well fluid;

(d) said mandrel and said barrel having shoulders at the ends of recessed opposite facing sidewalls defining a cylindrical chamber in the fluid isolated annular region;

(e) bearing means for providing telescoping and rotational movements of said mandrel in said barrel;

(f) a plurality of grooves extending longitudinally on said mandrel;

(g) rollers carried by said barrel and driveably engaged within said grooves to enable said mandrel to rotate relative to said barrel upon telescoping movements therein;

(h) a plurality of rings stacked in said cylindrical chamber between said shoulders;

(i) wherein cylindrical metal guide rings are included at each end of the stack of rings, said metal guide rings having a specified hardness;

(j) captured resilient shock absorbing ring means comprising said stack of rings between said metal guide rings, said ring means being formed of a resilient material to absorb shock and being less hard than said metal rings;

(k) cylindrical crossover rings interposed between and adja-

cent said guide ring and said rings means, and said crossover rings providing a fluid seal between said mandrel and said barrel, said crossover rings being formed of a material less hard than said guide rings and harder than said ring means to provide transitional yielding cushion and rotary bearing between said metal guide rings and said ring means when axially loaded within said chamber; and

stop means for limiting by said members the inward and outward telescoping movement of said mandrel in said barrel during right hand rotation of the drill string which promotes outward movement of said mandrel in said barrel whereby shock forces across said body are initially absorbed by the inward and outward telescoping movement of said mandrel in said barrel along said grooves and the excess shock forces are absorbed by the stack of said members within said cylindrical chamber on further inward/outward movement of said mandrel within said barrel.

4,443,207

PROTECTIVE DEVICE FOR DRIVE SHAFT UNIVERSAL JOINT ASSEMBLY

Theo Buthe, Lohmar, and Felix Mikeska, Siegburg, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,665

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026062

Int. Cl.³ F16D *3/84*; F16P *1/00*

U.S. Cl. 464—172 **1 Claim**

1. In a protective device for a universal joint assembly arranged as part of a drive shaft assembly connecting a tractor to an agricultural implement,

said drive shaft assembly including

a drive shaft connected to at least one side of a universal joint, and

a shank member of said universal joint extending from said one side of said universal joint, said shank member having an annular groove formed therein;

said protective device including

a protective boot extending to cover said universal joint assembly including a conical connecting portion extending toward said drive shaft, and

a pair of telescopic protective tubes surrounding said drive shaft, one of said protective tubes having an inner annular groove therein,

the improvement of a connecting assembly between said protective boot and said pair of telescopic protective tubes, said connecting assembly comprising:

a connecting piece having

a funnel-like extension which partially projects into said conical connecting portion of said protective boot to support said conical connecting portion, said conical connection portion of said protective boot terminating on said funnel-like extension,

through-holes,

a continuous outer groove and

locking means engaging in said inner annular groove of said one protective tube to hold said connecting piece against axial displacement relative to said one protective tube;

an annular bearing body having

a protuberance engaging into said annular groove formed in said shank member, and

locking tongues received in said through-holes of said connecting piece; and

a securing ring extending about and engaged within said continuous outer groove in said connecting piece, said securing ring having

a stop face axially fixing said locking tongues in said through-holes and

a conical collar having a conical configuration which corresponds to the configuration of said funnel-like extension holding said conical connecting portion of said protective boot against said funnel-like extension;

said through-holes opening toward an end of said connecting piece which is on a side thereof toward said protective boot and having a length which exceeds the width of said continuous outer groove by the thickness of said locking tongues;

said securing ring being arranged with said conical collar over said conical connecting portion of said protective boot to hold said conical connecting portion pressed between said conical collar and said funnel-like extension of said connecting piece.

4,443,208

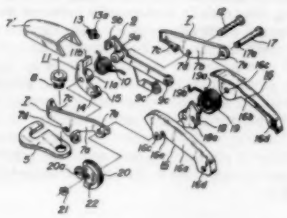
SPEED-CHANGE GEAR MOUNTED OUTSIDE A BICYCLE

Kunitoshi Kozakae, Ageo, Japan, assignor to Bridgestone Cycle Co. Ltd., Japan

Filed Dec. 16, 1980, Ser. No. 217,107

Int. Cl.³ F16H *11/08*

U.S. Cl. 474—82 **4 Claims**



1. A speed-change gear mounted outside a bicycle having a multi-step sprocket assembly engaging a chain, said speed-change gear comprising a fitting member secured to a frame of the bicycle; a parallel link means including an inside link with one end thereof rotatably connected to the fitting member by an inside link connecting shaft and an outside link with one end thereof rotatably connected to the fitting member by an outside link connecting shaft; a movable member connected to opposite ends of said inside link and said outside link; a changeover frame carrying a guide wheel and a tension wheel of the chain, said changeover frame being rotatably mounted on said movable member; a speed-change actuating cam and a spring biasing said cam rotationally in one direction, said cam and said biasing spring being carried directly by said outside link connecting shaft and capable of rotating with respect to said outside link about said outside link connecting shaft, said outside link having a portion thereof to cover said speed-change actuating cam, said biasing spring, and outside of said movable member; an L-shaped transmission lever pivotally carried by said inside link connecting shaft, and a lever-actuating spring, said lever having one end thereof urged against said speed-change actuating cam by said lever-actuating spring and the opposite end thereof selectively engageable with said inside link, said inside link having a portion thereof enclosing said L-shaped lever and said lever-actuating spring therein; a cover to enclose outer surfaces of said inside link and said outside link, said cover being connectable to said fitting member; and

a circular shaped reel integrally secured to that portion of said outside link connecting shaft which extends outside said fitting member, said reel having an inner wire of an operating wire means connected thereto, and being connected to said speed-change actuating cam so as to rotate therewith, whereby said cam rotates in response to a pulling of said inner wire of an operating wire means.

4,443,209

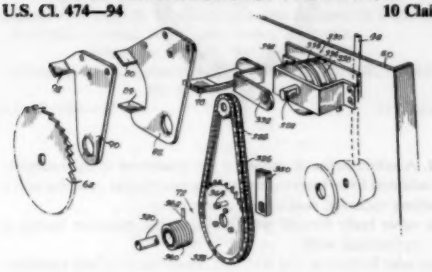
GAMING APPARATUS HAVING MANUALLY CONTROLLABLE-OPERATING SPEED

Donald E. Hooker, Wilmette, and Roman A. Tojza, Chicago, both of Ill., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Division of Ser. No. 119,217, Feb. 7, 1980. This application Sep. 25, 1981, Ser. No. 305,399

Int. Cl.³ F16H *55/42, 57/00, 57/10;* **G05G** *1/00*

U.S. Cl. 474—94 **10 Claims**



1. Apparatus for use in an amusement or game device of the type which has an operating handle that is pulled through a stroke upon initiation of operation by an operator, said apparatus absorbing excessive force that can be applied by an operator pulling the operating handle at a high speed through its stroke and comprising:

an operating shaft journaled for rotation in said game device and having said operating handle attached to one portion thereof;

a drive sprocket means carried by said shaft and being free to rotate relative thereto, said sprocket means having transverse extensions on opposite sides of said sprocket means;

first and second arm means, each being operably attached to said shaft to rotate with said shaft, said arm means being spaced from one another along said shaft;

a torsion spring means positioned around said shaft and located between said first and second arm means, said spring means having one end bearing on said first arm means and an opposite end bearing on one of said sprocket means extensions, the other of said sprocket means extensions bearing on one side of said second arm means;

the pulling of said handle tending to separate said other sprocket means extension from said second arm means, said spring means being biased in a direction to provide a force tending to maintain contact between said other sprocket means extension and said second arm means.

4,443,210

TENSION ROLLER FOR BELT DRIVES

Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

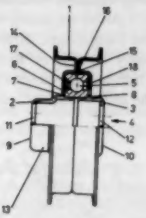
Filed Jun. 1, 1981, Ser. No. 268,886

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 8017101[U]

Int. Cl.³ F16H *55/42, 7/18, 7/12*

U.S. Cl. 474—199 **13 Claims**

1. A tension roller for belt drives, comprising a hollow pin and a roller member supported on said pin by way of a rolling bearing, said rolling bearing having an inner ring, rolling means, and an outer ring, said roller member being supported on said outer ring, said pin being comprised of two thinwalled



sleeves inserted in opposite ends of the bore of said inner ring of said rolling bearing, at least one of said sleeves being provided on the surface thereof with a radial shoulder for emplacement by contact with said inner ring.

4,443,211

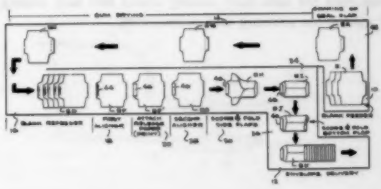
ENVELOPE ASSEMBLY APPARATUS

Robert E. Wooley, Charlotte, N.C., assignor to National Service Industries, Inc., Atlanta, Ga.

Filed Nov. 19, 1981, Ser. No. 323,961

Int. Cl.³ B31B *1/16, 1/74*

U.S. Cl. 493—188 **7 Claims**



1. In an envelope forming machine of the type including frame means supporting envelope blank feed means for feeding envelope blanks along a feed path from an upstream end serially past aligner means, a printer transfer roller adjacently above selectively operable printer means, scoring means and folding means to an envelope delivery station, the improvement comprising release paper patch applying means positioned adjacent said transfer roller and being operable to apply a patch of release paper to adhesive on a flap of each envelope as each of said envelope flaps passes over said printer transfer roller which serves as a backup roller against the flap during the application of the patch of release paper to the opposite side thereof.

4,443,212

APPARATUS FOR MANUFACTURE OF PAPER TUBE

Tomiyuki Mochizuki, 2474-5 Ichijyukubo, Ohbuchi, Fuji-shi, Shizuoka-ken, Japan

Filed Oct. 29, 1981, Ser. No. 316,226

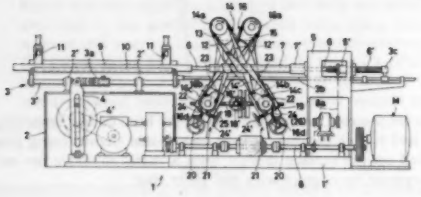
Claims priority, application Japan, Mar. 27, 1981, 56-44163

Int. Cl.³ B31C *3/00*

U.S. Cl. 493—289 **4 Claims**

1. A paper tube making machine, comprising in combination a machine frame; at least two hollow fixed shafts disposed parallel to each other and attached at the base ends thereof to said machine frame; at least one arm plate pivotally mounted on said machine frame at an angle relative to said fixed shaft; at least two sets of opposite pulleys, one of each set of pulleys being mounted on one end portion of said arm plate, the other

of each set of pulleys being mounted on a pulley base attached slidably to said arm plate, at least two endless rolling belts each stretched between each set of opposite pulleys and wound diagonally around one of said fixed shafts so as to roll one or more paper tapes being supplied between itself and the corresponding fixed shaft; a pulley adjusting means adapted to slide said pulley base in the longitudinal direction of said arm plate so as to simultaneously stretch or loosen said at least two endless rolling belts; belt-tension adjusting devices provided on said arm plate for the individual endless rolling belts so as to



adjust the tension of the individual endless rolling belts; spindles pierced through the interiors of the fixed shafts; core cutting shafts connected coaxially to the front ends of the spindles protruding from the free ends of the fixed shafts by means of a connector; a sliding table disposed on the machine frame so as to be slid axially on the core cutting shafts and adapted to support the core cutting shafts in a horizontal direction; means for integrally reciprocating said spindles, said connectors for said core cutting shafts and said sliding table; and means for rotating said connectors.

4,443,213

DECANTING TYPE CENTRIFUGE

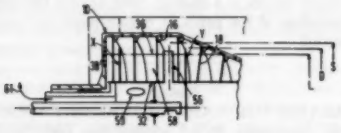
Geoffrey L. Grimwood, Holmfirth, Nr. Huddersfield, and John Wright, Huddersfield, both of England, assignors to Thomas Broadbent & Sons Limited, Huddersfield, England

Filed Jul. 12, 1983, Ser. No. 513,044

Claims priority, application United Kingdom, Jul. 13, 1982, 8220297

Int. Cl.³ B04B *1/20*

U.S. Cl. 494—38 **13 Claims**



1. In a decanting type centrifuge having a main bowl which is adapted to be rotated about its longitudinal axis and which contains a helical scroll conveyor which is arranged to rotate about said main bowl axis at a slightly different speed to the main bowl for scrolling separated solids to a solids discharge end of the bowl, the improvement comprising means which act to isolate a gas volume radially inwardly of the inner liquid surface within said main bowl and passage means enabling gas to be extracted continuously from said gas volume to a location external to said main bowl.

4,443,214

VALVE FOR THE TREATMENT OF HYDROCEPHALUS

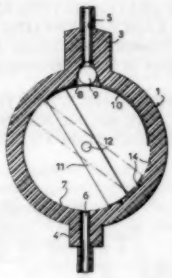
Bernard Marion, Montreuil sur Ille, France, assignor to Society dite: sophysa, Montreuil sur Ille, France

Filed Feb. 5, 1982, Ser. No. 346,193

Claims priority, application France, Mar. 18, 1981, 81 05389

Int. Cl.³ A61B *5/00*

U.S. Cl. 604—9 **5 Claims**



1. A subcutaeneous valve for the treatment of hydrocephalus adapted to be inserted between a ventricular catheter and a draining catheter, said valves comprising:

a valve body formed with a cylindrical chamber having a cylindrical wall;

an inlet formed in said wall and connectable to said ventricular catheter, an outlet formed in said wall opening into said chamber and connectable to said draining catheter;

means forming a valve seat at said inlet;

a valve member juxtaposed with said valve seat and engageable therewith to block flow from said chamber to said ventricular catheter but displaceable away from said valve seat to permit flow from said ventricular catheter into said chamber;

a rotor journaled in said chamber for rotation about the axis of said chamber and having a portion reaching toward said wall of said chamber, said rotor being provided with means magnetically couplable with an actuator externally of said body for magnetic rotation of said rotor in said chamber;

a spring blade fixed to said portion of said rotor, extending arcuately along said wall, bearing deflectably outwardly against said member and sliding thereon to bias said member against said seat with a force which is a function of the angular position of said rotor in said chamber; and

indexing means between said rotor and said wall for indexing said rotor in a selected one of a plurality of angular positions upon rotation of said rotor by magnetic coupling thereto.

4,443,215

STERILE DOCKING PROCESS, APPARATUS AND SYSTEM

James G. Smith, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

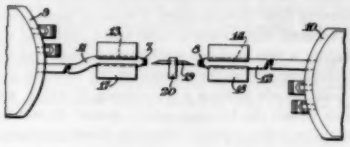
Filed Jul. 6, 1982, Ser. No. 395,598

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—29 **23 Claims**

1. A process of joining at least a first and a second closed thermoplastic tube together comprising forming a continuous

molten seal simultaneously between an end of a hot, multi-ended, hollow needle and a wall of each of said tubes, thereby

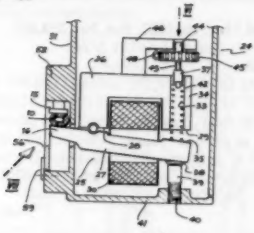


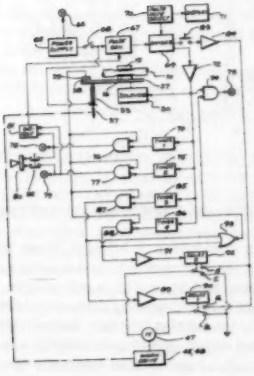
providing fluid communication, and cooling said seals and needle.

4,443,216
FLUID PUMP

Anthony G. Chappell, Mosman, Australia, assignor to Wellcome Australia Limited, New South Wales, Australia

Filed Apr. 9, 1982, Ser. No. 366,923
Claims priority, application Australia, Apr. 15, 1981, PE8460
Int. Cl.³ A61M 5/00
U.S. Cl. 604—67 **11 Claims**





1. A fluid pump device for use in conjunction with a chamber having a contained volume which can be reduced elastically and which incorporates or is locatable in circuit with spaced-apart unidirectional valves through which fluid can be passed with cyclic compression and expansion of the chamber; said pump device comprising:

a pair of spaced-apart clamp elements between which the pumping chamber is located in use of the device,

electrically energisable means operable when energized to move one of the clamp elements relative to the other in an opening direction to permit expansion of the chamber,

biasing means for exerting a closing force on the clamp elements whereby the chamber is biased to a compressed condition following de-energisation of the electrically energisable means,

timing means for detecting the time duration T incurred in compressing the chamber to a predetermined extent against back pressure exerted by fluid within the chamber,

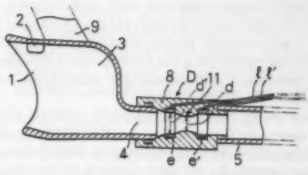
fault indicating means for providing a fault condition indication if during operation of the device the time duration T incurred in compressing the chamber is less than a first predetermined time period T_1 as a result of an excessively low back pressure being present in the chamber or is greater than second predetermined time period T_2 as a result of an excessively high back pressure existing in the chamber, and

electrically actuatable adjusting means for adjusting the force exerted by the biasing means so that, when the device is subjected to normal no-fault operating conditions, the terminal end of the time duration T is located within a time slot bounded by the predetermined time periods $T_1 > T$ and $T_2 < T$.

4,443,217
SUCTION TYPE URINATING AID

Yoshitaka Izumi, Tokyo, Japan, assignor to Kimura Bed Mfg. Company Limited, Tokyo, Japan

Division of Ser. No. 179,885, Aug. 20, 1980, Pat. No. 4,366,818. This application Jul. 14, 1982, Ser. No. 398,872
Claims priority, application Japan, Oct. 12, 1979, 54-140958; Oct. 12, 1979, 54-140959; Oct. 12, 1979, 54-140961; Oct. 12, 1979, 54-140962; Oct. 12, 1979, 54-140963
Int. Cl.³ A61F 5/44
U.S. Cl. 604—73 **3 Claims**



1. A suction type urinating aid comprising:

a urine receiver having a urine suction opening to be applied to the urinating region of a subject to receive therefrom urine, an air suction hole, and a urine outlet;

an electrically insulating hollow cylinder connected to said urine outlet;

a urine tank;

a urine transport tube connected between said cylinder and said urine tank;

vacuum device means connected to said urine tank for drawing air into said urine receiver through said air suction hole therein and for drawing said air and any urine in said urine receiver through said urine outlet, said cylinder and said urine transport tube into said urine tank;

control means connected to said vacuum device means for controlling the operation thereof;

detector means located in said cylinder, electrically connected to said control means, for detecting the presence of any urine in said cylinder and for causing said control means to operate said vacuum device means for drawing said air and urine from said urine receiver, said detector means comprising first and second ring-shaped electrodes positioned interiorly of said cylinder, said first and second electrodes being spaced from each other axially of said cylinder and electrically insulated from each other by said cylinder, said electrodes being positioned such that when urine exists in said cylinder, an electric current will flow through such urine between said electrodes and will be detected by said control means to start operation of said vacuum device means; and

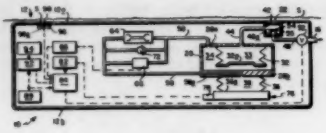
an inner diameter of a cylindrical portion of said cylinder between said electrodes being smaller than the inner diameter of said electrodes thereby forming means to minimize urine drainage accumulation.

4,443,218

PROGRAMMABLE IMPLANTABLE INFUSATE PUMP

Leonard J. DeCant, Jr., Allston, and Samir F. Idriss, Arlington, both of Mass., assignors to Infusaid Corporation, Norwood, Mass.

Filed Sep. 9, 1982, Ser. No. 416,282
Int. Cl.³ A61M 5/14
U.S. Cl. 604—67 **28 Claims**



1. A programmable implantable infusate pump comprising

A. a housing;

B. a variable volume infusate chamber in the housing;

C. means for conducting infusate from said chamber to an infusion site outside the housing;

D. a variable volume fluid pressure reservoir in the housing;

E. a variable volume fluid displacement reservoir in the housing;

F. a fluid path extending between the pressure reservoir and the displacement reservoir, said path defining a flow restriction, said reservoirs and said path arranged to be filled with a substantially incompressible control fluid;

G. means for monitoring the fluid pressure differential across said restriction and producing indications in response thereto;

H. means acting between a reference position and the pressure reservoir for applying a substantially constant force to the pressure reservoir tending to reduce its volume; and

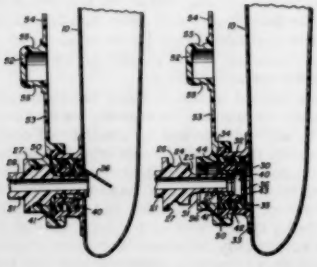
I. means responsive to said indications for intermittently shifting the reference position so as to maintain a selected infusate flow rate from said chamber.

4,443,219

SYSTEM FOR ASEPTICALLY DRAINING A URINE BAG

Charles E. Meisch, Hasbrouck Heights, and David M. Keating, Landing, both of N.J., assignors to C. R. Bard, Inc., Murray Hill, N.J.

Filed Mar. 10, 1981, Ser. No. 242,272
Int. Cl.³ A61M 1/00
U.S. Cl. 604—317 **5 Claims**



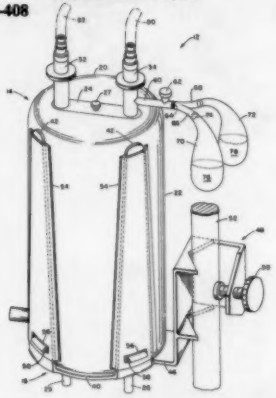
1. A system for aseptically removing urine from a drainage bag connected to a catheterized patient, said system comprising an outlet on said drainage bag adjacent the bottom thereof, normally closed valve means operatively connected to said outlet preventing flow therethrough, a housing means having an end face secured thereto and around said outlet, said valve means including a thin resilient wall having inner and outer faces and extending across the interior of the housing means and being centrally slit to form a self-closing slit valve, a second slit valve within the housing means spaced outwardly of said first slit valve, a flap closure within the housing means and being normally closed and resting against the inner face of said first mentioned slit valve, and a transfer bag for receiving urine removed from said drainage bag, spout means on said transfer bag, means on said transfer bag adapted to mate with said housing means of the drainage bag, said spout means adapted when inserted in said outlet to open both of said slit valves and flap closure to initiate removal of urine from said drainage bag.

4,443,220

BLOOD COLLECTION AND TRANSFER APPARATUS

Jerome M. Hauer, 307 Auburndale Ave., Auburndale, Mass. 02166, and Robert L. Thurer, 129 Pinckney St., Boston, Mass. 02114

Filed Mar. 16, 1982, Ser. No. 358,622
Int. Cl.³ A61M 5/14
U.S. Cl. 604—408 **14 Claims**



1. Blood collection and transfer apparatus comprising, in combination,

a collection bag comprising a foldable fabric forming a collapsible, sterilizable enclosure and having an annular side wall portion, said bag having a pair of openings each fitted with port means extending externally of the enclosure for a tubal connection, the side wall portion having collapsible stent engaging means forming an annular configuration thereabout and located externally of the enclosure, said bag being adapted for tubal connection separate from said pair of openings for transfer of blood therefrom, and

a stent having noncollapsible bag engaging means formed in an annular configuration to surround the distended bag, said stent engaging means and bag engaging means being mutually engageable to hold the bag in distended form with a negative gage pressure on the enclosure, and mutually releaseable with the bag being in distended form to permit the bag to collapse upon the subsequent transfer of blood therefrom.

4,443,221

TANNING METHOD

Max May, Bottmingen, Switzerland; Rolf Monsheimer, Darmstadt, and Ernst Pfleiderer, Darmstadt-Arheilgen, both of Fed. Rep. of Germany, assignors to Rohm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 354,202, Mar. 3, 1982, Pat. No. 4,398,911, which is a continuation of Ser. No. 169,847, Jul. 17, 1980, abandoned. This application May 21, 1982, Ser. No. 380,617

Claims priority, application Fed. Rep. of Germany, Jul. 26, 1979, 2930342

Int. Cl.³ C14C *11/00, 1/04, 1/08, 1/06*

U.S. Cl. 8—94.16 16 Claims

1. A process for the preparation of leather from skins and hides, which process includes the steps of deliming and bating for the preparation of unhaired skins and hides ready for tanning as well as the subsequent steps of tanning and dressing said unhaired skins and hides, wherein at least one float used in said process comprises from 0.01 to 0.2 percent, by weight of said float, of a lubricating material not binding to said skins and hides and selected from the group consisting of water soluble acrylate and methacrylate polymers, said float being used in an amount which is at most 100 percent of the weight of the skins and hides being treated therein.

4,443,222

ZINC PYRITHIONE PROCESS TO IMPART ANTIMICROBIAL PROPERTIES TO TEXTILES

Cletus E. Morris, and Clark M. Welch, both of Metairie, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 30, 1983, Ser. No. 527,894

Int. Cl.³ D06M *13/28, 13/38*

U.S. Cl. 8—189 5 Claims

1. A process for imparting to cellulosic textiles antimicrobial properties that are durable to laundering comprising:

(a) impregnating the cellulosic textile material with a solution of zinc pyrithione, sufficient amounts of polyamine capable of solubilizing the pyrithione complex per part of zinc pyrithione, and sufficient amounts of urea to provide one urea molecule for each primary and secondary amino group in the polyamine;

(b) heating the textile at sufficient temperature to drive off the moisture and complete the reaction.

4,443,223

COMPOSITION AND METHOD FOR IMPROVING THE FASTNESS OF DIRECT AND REACTIVE DYEINGS ON CELLULOSE-CONTAINING SUBSTRATES

Bruno Kissling, Hagendorf; Walter Knobel, Pratteln, and Tibor Robinson, Birsfelden, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 305,424, Sep. 24, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 413,015

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035916; Jun. 15, 1981, 3123662

Int. Cl.³ C08G *12/40;* D06M *15/54;* D06P *5/08*

U.S. Cl. 8—496 16 Claims

1. A process for improving the fastness properties of a direct or reactive dyestuff on a substrate comprising cellulose fibers, which process comprises applying to a substrate dyed or printed with such a dyestuff

(1) a water-soluble product of reacting in aqueous solution either

(A) a quaternary polyalkylene polyamine having at least one —NH—, —NH_2 or —OH group in each recurring unit and

(B) an N-methylol derivative of a urea, melamine, guanamine, triazine, urone, carbamate or acid amide,

or (A) and (B), as defined above, and

(A′) the product of reacting a mono- or polyfunctional primary or secondary amine with cyanamide, dicyanodiamide, guanidine or biguanidine, said component (A′) containing reactive hydrogen atoms bound to nitrogen, and (2) a catalyst (C) for crosslinking component (B), and subjecting the thus-treated substrate to a heat-curing step.

4,443,224

LIQUID REACTIVE DYESTUFF PREPARATIONS AND THEIR USE

Konrad Opitz, Liederbach, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 30, 1982, Ser. No. 393,717

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126081

Int. Cl.³ C09B *62/02;* D06P *1/38*

U.S. Cl. 8—527 8 Claims

1. A liquid water-containing dyeing preparation which comprises from 10 to 25 weight percent of one or more reactive dyestuffs, said one or more dyestuffs when in the free acid form being of the formula

$$(HO_3S)_m—F—Z_n$$

wherein

F is the radical of a chromophore of an anthraquinone dyestuff, mono-, dis- or trisazo dyestuff or of a phthalocyanine dyestuff,

m is an integer of from 1 to 8,

n is an integer of from 1 to 3 and

z is one or more fiber reactive radicals of monohalogen-symmetric-triazine; of mono- di- or trihalogen pyrimidine; of mono- or dichloroquinoxaline or dichlorophthalazine or dichloroquinazoline or dichloropyridazone, or bromine or fluorine derivatives thereof; or of sulfonyl-containing triazine, sulfonyl-containing pyrimidine or ammonium-containing triazine; or of pyrimidine-containing triazine; or of the aliphatic series;

from 5 to 25 weight percent of one or more solubilizers selected from the group consisting of tetramethyl urea, dimethyl formamide, N-methylacetamide, dimethyl sulfoxide, tetramethylene sulfone, N-methyl pyrrolidone, phosphoric acid tris-(dimethyl)amide, diethylene glycol dimethyl ether and ε-caprolactam;

from 1 to 20 weight percent of a sulfosuccinic acid derivative which is a semi-ester or a sulfosuccinic acid amide; and

from 1 to 6 weight percent buffer which does not react with Z so as to reduce the tinctorial strength in any substantial degree;

said dyeing preparation exhibiting a pH of from 3 to 7.

4,443,225

LIQUID-CRYSTALLINE PHASE OF AN AZO REACTIVE DYESTUFF, AND ITS USE FOR THE DYEING AND PRINTING OF NATURAL AND SYNTHETIC SUBSTRATES

Joachim Wolff, Cologne; Karlheinz Wolf, Leverkusen; Jochen Koll, Odenthal; Reinhold Hörnle, Cologne; Hans-Heinz Mölls, Leverkusen, and Volker Paulat, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

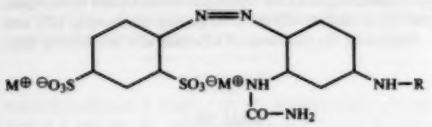
Filed Nov. 23, 1982, Ser. No. 444,024

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149129

Int. Cl.³ C09B *62/00;* D06P *1/38*

U.S. Cl. 8—549 5 Claims

1. Lyotropic liquid-crystalline aqueous phase of a reactive dyestuff of the formula



(I)

wherein

$M^{\oplus} = H^{\oplus}$ or an alkali metal cation and

R = a fibre-reactive grouping

present in water at room temperature in a concentration of 10–25%, optionally in the presence of concentration-increasing additives and/or optionally in the presence of buffer substances.

4,443,226

PROCESS FOR DYEING TEXTILE SHEET-LIKE STRUCTURES MADE OF POLYESTER FIBERS FOR USE AS WARNING PROTECTIVE CLOTHING

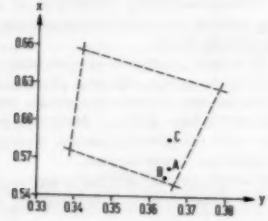
Helmut Röhser, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 337,963, Jan. 8, 1982, abandoned, which is a continuation of Ser. No. 192,308, Sep. 30, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 464,527

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1979, 2939918

Int. Cl.³ C09B *57/08*; D06P *1/16*

U.S. Cl. 8—532 **10 Claims**



1. A process for dyeing, by an exhaustion or a thermosol method, a textile sheet-like structure made from polyester fibers or from a mixture of polyester fibers and cotton, to produce a dyed structure suitable for use as protective clothing exhibiting an optical warning effect, without applying a coating or colored top layer, said dyed structure otherwise satisfying the requirements of DIN No. 16,954 as to

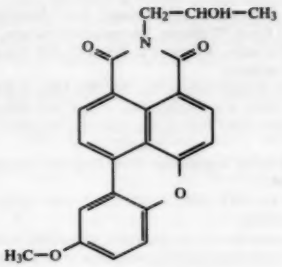
(a) color point, in that the shade of the dyeing yields a fluorescent orange-red;

(b) reflecting power, in that the luminance factor beta of the dyeing is not less than 0.35;

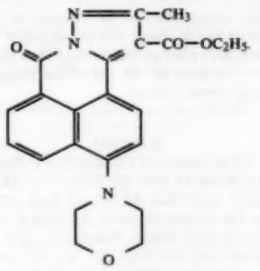
(c) color retention, in that no substantial fading of the orange-red shade to the yellow side of the spectrum, on exposure to daylight, occurs; and

(d) fastness properties, in that the fastness to light of the coloration is rated at least 5 according to DIN No. 54,004 when exposed to xenon light, while retaining the color properties set forth in (a), (b) and (c),

which comprises dyeing said structure with a base dyestuff which is 2,2'-bis-thionaphthene-indigo or a derivative of the red and pink series of aforesaid thioindigo, in combination with the dyestuff of the formula



and/or the dyestuff of the formula



4,443,227

INSTANT STARTING BRIQUETTES

Souren Z. Avedikian, 1012 N. Ocean Blvd. #909, Pompano Beach, Fla. 33062

Filed Jun. 28, 1982, Ser. No. 392,570

Int. Cl.³ C10L *5/32*

U.S. Cl. 44—6 **3 Claims**

1. An improved instant igniting charcoal briquette impregnated with a combustion supporting material selected from the group consisting of straight chain aliphatic alcohols, acids, or mixtures thereof which have minimal vapor pressure at room temperatures and mixture of which have a melting point above ambient temperatures and containing hexamine as a combustion initiating agent, said combustion supporting medium constituting from 10% to 20% by weight and said hexamine constituting from 0.75% to 3.0% weight percent of said briquette, said hexamine being admixed with said combustion supporting medium when said combustion supporting medium is above 92° C.

4,443,228

PARTIAL OXIDATION BURNER

Warren G. Schlinger, Pasadena, Calif., assignor to Texaco Inc., White Plains, N.Y.

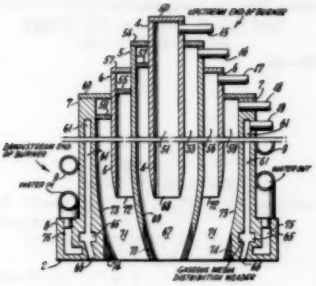
Filed Jun. 29, 1982, Ser. No. 393,264

Int. Cl.³ C10J *3/48*

U.S. Cl. 48—86 R **16 Claims**

1. A burner for introducing first and second reactant feedstreams into a partial oxidation gas generator comprising: a central conduit having a central longitudinal axis that is coaxial with the central longitudinal axis of the burner, closing means attached to the upstream end of said central conduit for closing off same; an unobstructed exit nozzle at the downstream end of the central conduit which discharges through a circular exit

orifice located upstream from the face of the burner to provide a central pre-mix chamber that discharges through an unobstructed circular exit orifice at the face of the burner, inlet means connected to the upstream end of the central conduit for introducing a first reactant feedstream; a second conduit coaxial and concentric with said central conduit along its length, an unobstructed exit nozzle at the downstream end of the second conduit which discharges through the circular orifice of said central pre-mix chamber at the face of the burner, spacing means between said central and second conduits for maintaining a spaced relationship and forming therebetween an unobstructed first annular passage with an unobstructed downstream annular exit orifice that discharges into the central pre-mix chamber, closing means attached to said second conduit and first annular passage at their upstream ends for closing off same, said central conduit passing through the upstream closed end of said second conduit and making a gastight seal therewith, and inlet means connected to the upstream end of the second conduit for introducing a second reactant feedstream; a third conduit coaxial and concentric with said second conduit along its length, spacing means for between said second and third conduits for maintaining a spaced relationship and forming therebetween an unobstructed second annular passage with an unobstructed downstream annular exit orifice located upstream from the face of the burner to provide a portion of an annular pre-mix chamber that discharges through an unobstructed annular exit orifice at the face of the burner

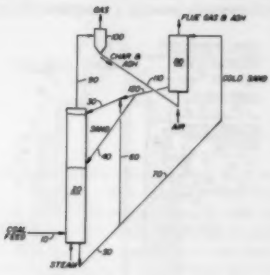


closing means attached to the second annular passage and third conduit at their upstream ends for closing off same, said second conduit passing through the upstream closed end of the third conduit and making a gastight seal therewith, and inlet means connected to the upstream end of the third conduit for introducing a third reactant feedstream; an outer conduit coaxial and concentric with said third conduit along its length, an unobstructed exit nozzle at the downstream end of the outer conduit which discharges through said annular exit orifice at the face of the burner, spacing means between said third and outer conduits for maintaining a spaced relationship and forming therebetween an unobstructed third annular passage with an unobstructed downstream annular exit orifice located upstream from the face of the burner that discharges into the remaining portion of said annular pre-mix chamber, closing means attached to the third annular passage and outer conduit at their upstream ends for closing off same, said third conduit passing through the upstream closed end of the outer conduit and making a gastight seal therewith, and inlet means connected to the upstream end of the outer conduit for introducing a fourth reactant feedstream; an outer annular water-cooled flat face-plate encircling the downstream end of the burner, said face-plate being cored to provide an annular passage for circulating water and an annular header for distributing a gaseous material, passage means extending longitudinally in the wall of said outer conduit and in communication with said distribution header, inlet means in communication with the upstream end of said longitudinal passage means for introducing said gaseous material, and downstream passage means in communication with said distribution header for discharging said gaseous material at the face of the burner.

4,443,229
GASIFICATION PROCESS FOR CARBONACEOUS MATERIALS

David Sageman, and David S. Mitchell, both of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jan. 31, 1983, Ser. No. 462,161
Int. Cl.³ C10J 3/46, 3/54
U.S. Cl. 48—197 R **7 Claims**



1. A method for gasification of a carboanceous material comprising:

(a) introducing a carbonaceous material into a lower portion of a reaction vessel;

(b) introducing a first portion of solid heat transfer material into an upper portion of said vessel and introducing a second portion of said heat transfer material into a middle portion of said vessel, wherein the second portion of heat transfer material is introduced into said vessel at a higher temperature than the first portion of heat transfer material;

(c) passing steam upwardly through said vessel to react with the carbonaceous material in said lower portion of said reaction vessel to form a hot char and a gaseous product, wherein the heat necessary for said reaction is supplied by both the first portion of heat transfer material and the second portion of heat transfer material;

(d) cooling the hot char and gaseous product in the upper portion by contact with the first portion of heat transfer material;

(e) removing the hot char and the gaseous product from an upper end of said reaction vessel; and

(f) removing the heat transfer material from a lower end of said vessel.

4,443,230
PARTIAL OXIDATION PROCESS FOR SLURRIES OF SOLID FUEL

Robert J. Stellaccio, Spring, Tex., assignor to Texaco Inc., White Plains, N.Y.

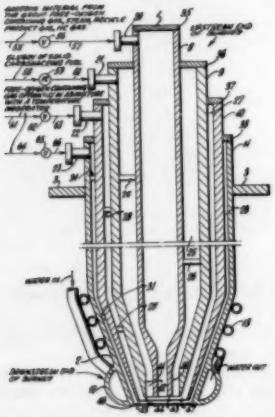
Filed May 31, 1983, Ser. No. 499,620
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R **14 Claims**

1. In a continuous process for the manufacture of gas mixtures comprising H_2 and CO and containing at least one material from the group CO_2, H_2O, N_2, CH_4, H_2S and COS, and entrained matter by the partial oxidation of a feedstream comprising a pumpable slurry of solid carbonaceous fuel in a liquid carrier and a feedstream of free-oxygen containing gas optionally in admixture with a temperature moderator, said partial oxidation occuring in the reaction zone of a free-flow gas generator at an autogenous temperature in the range of about

1700° to 3500° F., and a pressure in the range of about 5 to 250 atmospheres, the improvement which comprises:

(1) passing a stream of gaseous material from the group consisting of free-oxygen containing gas, steam, recycle product gas, and hydrocarbon gas through the central conduit of a burner mounted in the upper portion of said gas generator at a velocity in the range of about 76 feet per second to sonic velocity, said burner comprising radially spaced concentric central, second, third, and outer cylindrical conduits providing therebetween first, second, and outer concentric annular passages, said conduits and passages being closed at their upstream ends where feedstream inlets are provided and open at their downstream exit orifices for discharge;

(2) simultaneously passing a pumpable slurry stream of solid



carbonaceous fuel in a liquid carrier through said first annular passage at a velocity in the range of about 1 to 50 feet per second;

(3) simultaneously passing a stream of free-oxygen containing gas through said second and outer annular passages at a velocity in the range of about 76 feet per second to sonic velocity;

(4) mixing said feedstreams together prior to, at, or downstream from the outer conduit exit orifice to produce a mixture whose atoms of free-oxygen plus atoms of organically combined oxygen in the solid carbonaceous fuel per atoms of carbon in the solid carbonaceous fuel is in the range of about 0.5 to 1.95, and the weight ratio of H_2O/fuel is in the range of about 0.1 to 3; and

(5) reacting by partial oxidation the mixture from (4) in said reaction zone to produce said gas mixture.

4,443,231

CONTINUOUS CHROMATOGRAPHIC SEPARATIONS IN A MAGNETICALLY STABILIZED FLUIDIZED BED

Jeffrey H. Siegell, Westfield, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 2, 1982, Ser. No. 345,095

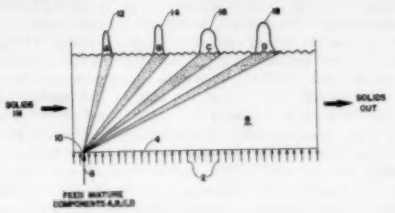
Int. Cl.³ B01D *15/08*

U.S. Cl. 55—3 **35 Claims**

1. A chromatographic process for continuously separating a feed mixture containing at least two components which comprises:

(a) introducing said mixture into a moving bed containing magnetizable particles, said bed being fluidized by a carrier fluid distributed along said bed and passing through said bed in an ascending manner transverse to the flow of said bed and being stabilized by a magnetic means having sufficient strength to suppress solids backmixing therein,

(b) contacting said mixture with an adsorbent in said bed for a period of time necessary to chromatographically separate at least a portion of one of said components from said mixture,



(c) recovering at least two streams, at least one of which is a product stream from said moving bed along the path of said bed, said product stream comprising a portion of the carrier fluid and a portion of the feed mixture containing at least a portion of one of said components.

4,443,232

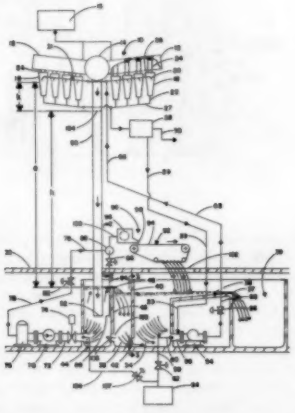
DEAERATED LIQUID STOCK SUPPLY

Robert G. Kaiser, Seminole, Fla., assignor to Clark & Vicario Corporation, Pinellas Park, Fla.

Filed Sep. 29, 1982, Ser. No. 427,914

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—41 **43 Claims**



1. Apparatus for providing deaerated stock to a processing machine, said apparatus comprising:

(a) an enclosed first receiver;

(b) means for maintaining said first receiver under a vacuum;

(c) means for introducing stock into said first receiver to thereby produce deaerated stock in said first receiver at a predetermined average production rate;

(d) stock supply means for supplying stock to be deaerated to said introducing means;

(e) a second receiver open to the atmosphere;

(f) means for conducting deaerated stock from said first receiver to said second receiver;

(g) means for withdrawing stock from said second receiver at a net rate of withdrawal lower than said average production rate, so that stock accumulates as a pond in said second receiver, said withdrawing means being operative to transfer the withdrawn stock to the processing machine;

(h) level control means for discharging a recycle portion of deaerated stock from said second receiver and varying the rate of such discharge to maintain the pond of stock in said second receiver at a predetermined pond level, said conducting means being operative to discharge deaerated stock into said second receiver at an elevation below said predetermined pond level;

(i) recycle means for passing said recycle stock discharged by said level control means to said introducing means.

29. A method of installing deaerated stock supply apparatus in a mill having a preexisting processing machine and an associated preexisting return fluid collection vessel, comprising the steps of:

(a) installing an enclosed first receiver and installing means for maintaining a vacuum in said first receiver;

(b) installing means for introducing stock into said first receiver;

(c) installing a first wall within said vessel so that said wall subdivides said vessel into a tank and a second receiver;

(d) connecting said first receiver to said second receiver and connecting said second receiver to said processing machine;

(e) installing means for controlling the level of stock in said second receiver by discharging recycle stock from such receiver; and

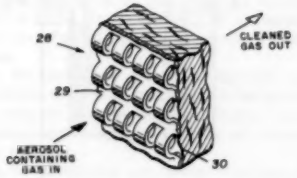
(f) installing recycle means for passing recycle stock to said stock-introducing means.

4,443,233

MIST SEPARATOR

Thomas M. Moran, Maryland Heights, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 27, 1982, Ser. No. 412,328
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—97 **9 Claims**



7. A process for removing particles from a particle-containing flowing gas stream comprising:

providing a perforated screen separator in said flowing gas stream, said perforated screen separator being a plate having parallel rows of perforations, said perforations being formed by making cuts in said plate to define parallel rows of strips and pushing alternate strips forward and backward from the plane of the plate to produce said parallel rows of perforations with said strips remaining alternately in front of and behind said perforations to form a tortuous path for said flowing gas stream;

causing said particle-containing gas to flow through said perforated screen separator; and

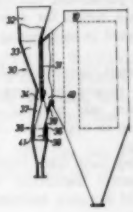
removing said particles having a diameter of at least approximately 10 microns from said flowing gas stream by impingement of said particles upon the surface of said perforated screen separator.

4,443,234

DEVICE AT A DUST FILTER

Kurt B. I. Carlsson, Växjö, Sweden, assignor to Flakt Aktiebolag, Nacka, Sweden

Filed Mar. 30, 1982, Ser. No. 363,419
Claims priority, application Sweden, Mar. 4, 1982, 8102154
Int. Cl.³ B03C *3/01, 3/14;* B01D *50/00*
U.S. Cl. 55—126 **7 Claims**



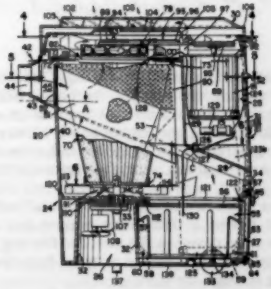
1. A device at a dust filter for cleaning a gas flow from dust, which dust filter comprises a filter chamber (10) with a gas inlet (12) and a gas outlet (13) and a filter unit (16) located in the filter chamber, which gas inlet (12) is provided with a precollector (30) for separating coarse dust from the gas flow prior to the passing of the gas flow through the filter unit, which precollector (30) is designed as a louvre collector (31) having at least one dust hopper (34) and dust discharge unit (35) located to collect and remove dust separated by the louvre collector by means of a partial gas flow, characterized in that the dust discharge unit (35) comprises a cyclone collector (36), the inlet portion (37) of which is integrated with the dust hopper (34), and the gas outlet portion of which for the partial gas flow flowing through the cyclone is designed as a passageway (39) having a mouth (40) which is located in the filter chamber (10) downstream from the louvre collector (31), and that the cyclone collector (36) is dimensioned so as to impart to the partial gas flow a pressure drop, which corresponds to the pressure drop of the gas flow through the louvre collector.

4,443,235

SELF-CLEANING CABINET DUST COLLECTOR

David L. Brenholt, Menomonie, Wis., and Daniel T. Risch, Minneapolis, Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.

Filed Oct. 1, 1982, Ser. No. 432,351
Int. Cl.³ B01D *46/04, 50/00*
U.S. Cl. 55—218 **22 Claims**



1. An apparatus for filtering air laden with dust and other particulate matter and for collecting the filtered dust and particulate matter, said apparatus comprising:

a housing having a closed bottom portion, an open top por-

tion, a generally hollow interior, a substantially hollow wall extending between said top and bottom portions, said wall having an exterior member and an interior member defining an air flow passageway therebetween, with said passageway being in fluid flow communication with said housing interior, inlet means in said exterior member for introducing dust-laden air into said passageway, said interior member including means therein for precleaning said entering air flow, means in said bottom portion for collecting dust and particulate matter separated from said air flow, and ramp means for directing dust and particulate matter, separated in said passageway, into said collecting means;

means in said housing interior for filtering the precleaned air, said filtering means including a flexible filter element suspended from said housing upper portion, said filter element having an uppermost open end and a closed bottommost end;

means for flexing said filter element to remove dust and particulate matter therefrom, said flexing means being located in said housing bottom portion exterior to said filter element;

said element flexing means further including means for propelling dust and particulate matter removed from said element into said collecting means;

a cover removably secured on said housing top portion, said cover including means for allowing egress of filtered air from said housing; and

fan means in fluid flow communication with said housing interior for drawing air flow therethrough from said inlet means, said fan means being positioned proximate said filtering means.

4,443,236

SELF-CLEANING SCREEN FOR THE COOLING AIR INLET OF AN ENGINE ENCLOSURE

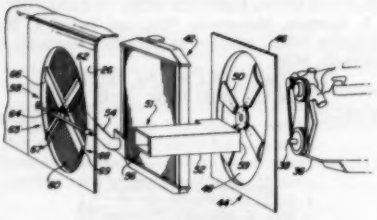
Rolf Peiler, Zweibrucken, Fed. Rep. of Germany, assignor to Deere & Company, Moline, Ill.

Filed Oct. 28, 1982, Ser. No. 437,427

Claims priority, application European Pat. Off., Nov. 14, 1981, 81 109690.8

Int. Cl.³ B01D *35/02, 35/18, 46/04*

U.S. Cl. 55—269 **11 Claims**



1. In an agricultural machine having a mobile body and a power unit carried by the body, the power unit including a wall having an air inlet, an internal combustion engine, a heat exchanger for cooling the engine and a blower operable to draw cooling air through the inlet and over the heat exchanger, an improved air cleaning apparatus for the cooling air comprising:

an air filter supported adjacent the wall and including a filter element having a foraminous portion and exterior and interior sides covering the inlet for filtering and holding on its exterior side, foreign material from the cooling air moving through the inlet;

an exhaust passage having an outlet communicating with the upstream side of the blower and an inlet adjacent the interior side of the filter element so that the blower may draw air through the passage from the inlet to the outlet;

an exhaust sweep assembly including an elongated sweep defining a collecting duct adjacent the exterior side of the filter element, said duct having an air inlet portion including a first inlet adjacent and open to and spanning a portion of the exterior side of the filter element and an outlet portion axially adjacent the inlet portion and including an outlet, said sweep assembly being mounted for sweeping motion relative to the filter element so that the first air inlet sweeps at least a portion of the exterior side of the filter element, and said duct outlet communicating with the exhaust passage inlet so that the blower draws air into and through the duct via the duct inlet, some air being drawn directly from the atmosphere externally adjacent the filter element and some of the drawn air being diverted from the interior side of the filter element and drawn outwards through the filter element, and being drawn through the duct inlet entraining foreign material held on the exterior side of the filter element and carrying it through the duct to the duct outlet and into the exhaust passage;

means for mounting the sweep assembly adjacent said filter element; and

means for imparting a sweeping motion to the sweep assembly.

4,443,237

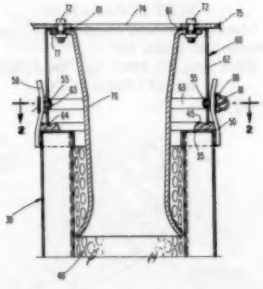
DUST COLLECTING FILTER CARTRIDGE AND ATTACHMENT STRUCTURE FOR SUSPENDING SAME FROM BAGHOUSE TUBE SHEET

Edward A. Ulvestad, Naperville, Ill., assignor to Flex-Kleen Corporation, Chicago, Ill.

Filed Nov. 22, 1982, Ser. No. 443,389

Int. Cl.³ B01D *46/52*

U.S. Cl. 55—379 **9 Claims**



1. A dust filter baghouse comprising;

A. a baghouse tube sheet having a plurality of holes therein;

B. a small-diameter filter cartridge, said filter cartridge comprising a cylindrical perforated sleeve, an annular pleated filter media which encircles said sleeve, a collar secured to the upper end of said filter media, and an annular resilient cuff secured to the upper surface of said collar;

C. attachment structure suspending said filter cartridge from said baghouse tube sheet, said attachment structure comprising:

a. a cylindrical bag cup having a vertical sidewall;

b. means suspending said bag cup from said tube sheet in registry with one of the holes therein;

c. said bag cup having an annular groove in the sidewall thereof;

d. a circular series of spaced apart generally vertical resilient fingers projecting upwardly from, and secured to, said cartridge collar, each of said fingers having an inward projection positioned and arranged such that the sidewall of said cup engages each of said inward projections on said fingers and cams said fingers radially out-

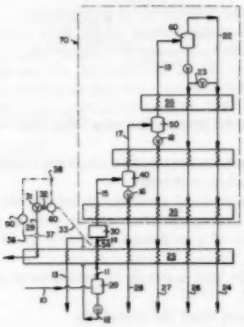
wardly, said projections subsequently coming into registry with said annular groove in the sidewall of said bag cup, whereupon said projections snap into said groove, thereby latching said filter cartridge to said bag cup, and

e. clamp means for securing said finger projections in said bag cup groove in latching position.

4,443,238
RECOVERY OF HYDROGEN AND OTHER COMPONENTS FROM REFINERY GAS STREAMS BY PARTIAL CONDENSATION USING PRELIMINARY REFLUX CONDENSATION

Robert A. Beddome, Kenmore; John B. Saunders, Tonawanda, and Gary W. Fenner, Grand Island, all of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 19, 1982, Ser. No. 399,294
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—17 **5 Claims**



1. A method for removing a major portion of C_5+ hydrocarbon content from a water-laden hydrogen and hydrocarbon-containing gas stream comprising the steps of:

(a) pressurizing a water-laden, gas consisting essentially of hydrogen, methane, C_2, C_3, C_4, and C_5+ hydrocarbons at a pressure above about 400 psia, to provide a pressurized gas stream,

(b) passing the pressurized gas stream through separator means, adapted to permit the upward flow of gas simultaneously with the downward flow of liquid, to a reflux condensation zone having a plurality of indirect heat exchange passages,

(c) flowing the pressurized gas stream upwardly through some but not all of the plurality of passages of the reflux condensation zone in indirect heat exchange with a refrigerant stream flowing through other passages of the reflux condensation zone so as to partially condense the pressurized gas stream within the reflux condensation zone, to generate a reflux liquid which flows downwardly in the plurality of the gas stream carrying passages to rectify the upwardly flowing pressurized gas, the reflux liquid gradually becoming enriched with C_5+ hydrocarbon constituents of the pressurized gas stream and being passed from said reflux condensation zone to said separator means and being collected from said separator means,

(d) controlling step (c) so that the partial condensation of the pressurized gas stream within the reflux condensation zone occurs at a temperature above about 240° K. (−30° F.) with suppression of any hydrate formation,

(e) separately recovering from the reflux condensation zone condensate liquid which contains a major portion of the C_5+ hydrocarbon content of the pressurized gas stream and uncondensed pressurized gas stream,

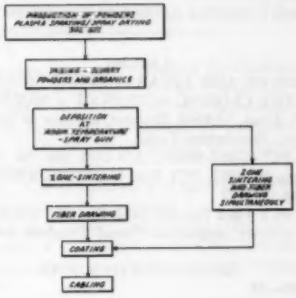
(f) drying the water-laden pressurized gas stream prior to step (g) to provide an essentially water-free gas suitable for cryogenic processing,

(g) further cooling the essentially water-free gas stream recovered in step (e) in a partial condensation zone to condense a major portion of the residual hydrocarbon constituents thereof and separating the unliquified gas and further cooling said unliquified gas to obtain a predominantly hydrocarbon residual condensate and a predominantly hydrogen unliquified gas product.

4,443,239
FABRICATION OF OPTICAL WAVEGUIDES USING SLURRY DEPOSITION

Dipak R. Biswas, and Dilip K. Nath, both of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 20, 1982, Ser. No. 379,835
Int. Cl.³ C03B *19/06*
U.S. Cl. 65—3.11 **14 Claims**



1. A process for manufacturing an optical preform, comprising the steps of

providing a bait;

forming at least one slurry containing particles of an optical material with a predetermined index of refraction suspended in a liquid vehicle, including coating the particles with a binder;

depositing at least one cohesive layer of the particles on the bait, including covering at least a portion of the bait with the slurry and evaporating the liquid vehicle while keeping the binder for the latter to hold the particles together in the cohesive layer subsequent to the evaporation of the liquid vehicle;

dissociating the cohesive layer from the bait;

removing the binder from the cohesive layer; and sintering the cohesive layer into the preform.

4,443,240
METHOD FOR PRODUCING GLASS PARTICLES IN MOISTURE PROTECTED CONDITION

Thomas C. Shutt, and L. Wayne Snider, Denver, Colo.

Continuation of Ser. No. 943,035, Sep. 18, 1978, abandoned, which is a continuation of Ser. No. 759,698, Jan. 17, 1977, abandoned, which is a division of Ser. No. 565,238, Apr. 4, 1975, Pat. No. 4,016,131. This application Mar. 3, 1980, Ser. No. 126,916
Int. Cl.³ C03C *19/00, 23/00*
U.S. Cl. 65—21.1 **6 Claims**

1. Method of preparing an unsaturated polyester-reactive material for actively enhancing the physical and chemical properties of a cured polyester resin thereafter cured in intimate admixture therewith comprising substantially precleaned, dry and moisture-protected, homogeneous, in situ originally dry nascently fractured and freshly exposed surface created, active soda-containing silicate glass particles continu-

ously maintained in original nascently fractured and freshly exposed surface created condition and in original dry condition and having a high and irregular original nascently fractured and freshly exposed condition surface area, an average particle size below about 40 mesh and an active cured polyester structurally reinforcing property, and being maintained in moisture-protected condition in an environment preventing moisture contamination, which comprises washing soda-containing silicate glass of above about 40 mesh to clean such glass, drying the washed and clean glass, and crushing the resultant dried glass in situ in the absence of moisture whereby to obtain substantially pre-cleaned, dry and moisture-protected, homogeneous, in situ originally dry nascently fractured and freshly exposed surface created, active soda-containing silicate glass particles continuously maintained in original nascently fractured and freshly exposed surface created condition and in original dry condition and having a high and irregular original nascently fractured and freshly exposed condition surface area, an average particle size below about 40 mesh and an active cured polyester structurally reinforcing property, and maintaining said particles in moisture-protected condition in an environment preventing moisture contamination.

4,443,241
METHOD OF AND APPARATUS FOR MONITORING THE CLOSING ACTION OF A MOULD

Stanley P. Jones, Tickhill, England, assignor to Emhart Industries, Inc., Farmington, Conn.

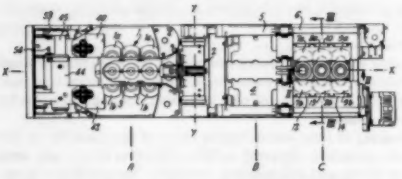
PCT No. PCT/GB82/00051, 371 Date Sep. 30, 1982, 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02878, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 22, 1982, Ser. No. 432,926

Claims priority, application United Kingdom, Feb. 27, 1981, 8106178

Int. Cl.³ C03B *11/16, 9/40*

U.S. Cl. 65—29 **9 Claims**



1. A method of monitoring the closing action of a mould (**1, 7, 8, 9**) of a glassware forming machine in a cyclic process of forming glassware, the method comprising producing a signal representative of the position of a part of the mould (**1***a*, **7***b*, **8***b*, **9***b*) at a time in the cyclic process when the mould (**1, 7, 8, 9**) should be closed and comparing the signal with a signal representative of the position of the mould part (**1***b*, **7***b*, **8***b*, **9***b*) when the mould is correctly closed, characterised in that the signal representative of the position of the mould part (**1***b*, **7***b*, **8***b*, **9***b*) when the mould (**1, 7, 8, 9**) is closed is produced by averaging a selected number of the immediately preceding signals representative of the position of the part of the mould at the time when the mould should be closed.

2. Apparatus for use in monitoring the closing action of a mould (**1, 7, 8, 9**) of a cyclicly-operating glassware forming machine, the apparatus comprising a position sensitive device (**30, 52**) operable to produce a signal representative of the position of a part of the mould (**1***b*, **7***b*, **8***b*, **9***b*), producing means (**63, 64, 65**) operable to produce a signal representative of the position of the mould part when the mould is correctly closed, and comparing means (**62**) operable to compare the signals produced by the position sensitive device (**30, 52**) and the producing means (**63, 64, 65**) at a time in the cyclic operation of the machine when the mould (**1, 7, 8, 9**) should be closed, characterised in that the producing means (**63, 64, 65**) produces its signal by averaging a selected number of immediately preceding signals of the position sensitive device (**30, 52**).

4,443,242
FOLIAR FEED

Rodney Fox, Cottingham, England, assignor to Reckitt & Colman Products Limited, United Kingdom

Filed Jan. 18, 1982, Ser. No. 340,462

Claims priority, application United Kingdom, Jan. 21, 1981, 8101804

Int. Cl.³ C05G *3/00*

U.S. Cl. 71—11 **25 Claims**

1. A method for the preparation of a foliar feed comprising the steps of:

(a) dissolving plant nutrient in water to form a foliarly effective aqueous solution thereof;

(b) forming a water-in-oil emulsion by mixing the said foliarly effective aqueous solution and an aerosol propellant in the presence of a surfactant providing an HLB in the range of from 3 to 6;

(c) containing the said water-in-oil emulsion in an aerosol container; and,

(d) purging oxygen from the container.

15. A ready to use foliar composition comprising a water-in-oil emulsion, the aqueous phase containing dissolved plant nutrient and the oil phase including an aerosol propellant and a surfactant providing an HLB in the range of from 3 to 6 the emulsion being contained in a hand-operable pressure dispensing container.

4,443,243
N-PHENYLSULFONYL-N-TRIAZINYLUREAS

Werner Fory, Basel; Karl Gass, Magden; Willy Meyer, Riehen, and Rolf Schurter, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

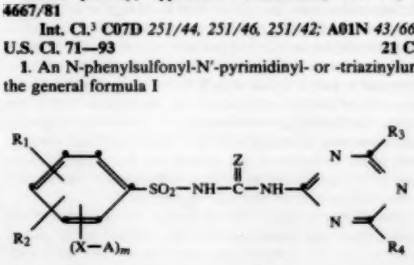
Filed Jul. 9, 1982, Ser. No. 396,959

Claims priority, application Switzerland, Jul. 16, 1981, 4667/81

Int. Cl.³ C07D *251/44, 251/46, 251/42;* **A01N** *43/66*

U.S. Cl. 71—93 **21 Claims**

1. An N-phenylsulfonyl-N'-pyrimidinyl- or -triazinylurea of the general formula I



(I)

wherein

A is a C_3–C_6-alkynyl group,

X is oxygen, sulfur or a sulfinyl or sulfonyl bridge,

Z is oxygen or sulfur,

m is the number one or two,

R_1 is hydrogen, halogen, C_1–C_5-alkyl or C_2–C_5-alkenyl or a group —Y—R_5,

R_2 is hydrogen, halogen, C_1–C_5-alkyl, C_2–C_5-alkenyl or C_1–C_4-haloalkyl, or a group —Y—R_5, —$COOR_6$, —NO_2 or —CO—NR_7—R_8,

R_3 and R_4 independently of one another are hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkylthio, C_1–C_4-haloalkyl, C_1–C_4-haloalkoxy, halogen or alkoxyalkyl having at most 4 carbon atoms,

R_5 and R_6 are each C_1–C_5-alkyl, C_2–C_5-alkenyl or C_2–C_6-alkynyl,

R_7 and R_8 independently of one another are each hydrogen, C_1–C_5-alkyl, C_2–C_5-alkenyl or C_2–C_6-alkynyl, and

Y is oxygen, sulfur or a sulfinyl or sulfonyl bridge;

and the salts of these compounds.

15. A method of controlling undesired plant growth, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim **1**.

4,443,244

HERBICIDAL SULFONAMIDES

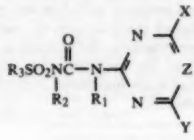
George Levitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 151,245, Jul. 13, 1982, Pat. No. 4,339,266, which is a division of Ser. No. 840,167, Oct. 6, 1977, Pat. No. 4,257,802. This application Apr. 21, 1982, Ser. No. 370,395

Int. Cl.[3] **A01N** *43/66*; **C07D** *409/12*

U.S. Cl. 71—93 **12 Claims**

1. A compound having the formula:



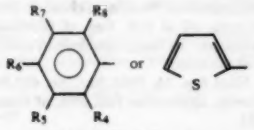
(I)

wherein

R_1 is H, alkyl of one to three carbon atoms or —OCH_3;

R_2 is H or alkyl of one to three carbon atoms;

R_3 is



R_4 and R_7 are independently hydrogen, fluorine, chlorine, bromine, alkyl of 1-4 carbon atoms, alkoxy of 1-4 carbon atoms, nitro, CF_3, CH_3S– or CH_3CH_2S–;

R_5, R_6 and R_8 are independently hydrogen, fluorine, chlorine, bromine or methyl;

X is Cl, CH_3, —CH_2CH_3, alkoxy of one to three carbons, CF_3, CH_3S—, CH_3OCH_2— or $CH_3OCH_2CH_2O$—;

Y is CH_3 or OCH_3; and

Z is N;

and their agriculturally suitable salts; provided that:

a. R_1 and R_2 may not simultaneously be hydrogen.

b. when R_4 and R_8 are both hydrogen, at least one of R_5, R_6 or R_7 must be hydrogen;

c. when R_6 is H and all or R_4, R_5, R_7, and R_8 are other than H, then all of R_4, R_5, R_7 and R_8 must be either Cl or CH_3; and

d. when R_6 is other than H, at least one of R_4, R_5, R_7 and R_8 is other than H and at least two of R_4, R_5, R_7 and R_8 must be hydrogen.

9. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim **1**.

4,443,245

N-PHENYLSULFONYL-N'-TRIAZINYLUREAS

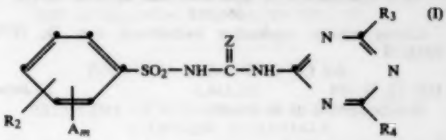
Willy Meyer, Riehen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 282,847, Jul. 13, 1981, abandoned. This application Jan. 17, 1983, Ser. No. 458,587

Int. Cl.[3] **C07D** *251/42*; **A01N** *43/66*; **C07D** *251/44, 251/46*

U.S. Cl. 71—93 **37 Claims**

1. A N-phenylsulfonyl-N'- or -triazinylurea of the formula I



(I)

wherein

A is a C_2–C_6alkenyloxy, a C_2–C_6haloalkenyloxy a C_2–C_6-haloalkenylthio, a C_2–C_6haloalkenylsulfinyl or a C_2–C_6-haloalkenylsulfonyl radical

Z is oxygen or sulfur,

m is 1 or 2,

R_2 is hydrogen, halogen, C_1–C_5alkyl, C_2–C_5alkenyl, C_1–C_4-haloalkyl, or a radical —Y—R_5, —$COOR_6$, —NO_2 or —CO—NR_7—R_8, R_3 and R_4, each independently of the other, are hydrogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4alkylthio, C_1–C_4haloalkyl, halogen or alkoxyalkyl of at most 4 carbon atoms,

R_5 and R_6, each independently of the other, are C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl,

R_7 and R_8, each independently of the other, are hydrogen, C_1–C_5alkyl, C_2–C_5alkenyl or C_2–C_6alkynyl, and

Y is oxygen, sulfur, a sulfinyl or sulfonyl bridge, or a salt thereof.

34. A method of controlling undesired plant growth, which method comprises applying thereto or to the locus thereof a herbicidally effective amount of a compound according to claim **1**.

4,443,246

HERBICIDAL PYRIDYL-ETHOXY-PHENYL UREA DERIVATIVES

Yutaka Kawamatsu, Kyoto; Takahiro Saraie, Toyono, and Harutoshi Yoshikawa, Yawata, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

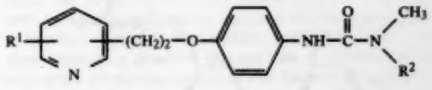
Filed Jun. 7, 1982, Ser. No. 385,857

Claims priority, application Japan, Jun. 16, 1981, 56-93549

Int. Cl.[3] **A01N** *43/40*; **C07D** *213/86*

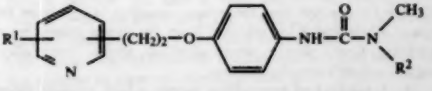
U.S. Cl. 71—94 **5 Claims**

1. A compound of the general formula:



wherein R^1 stands for a lower alkyl group; and R^2 stands for a lower alkyl group or a lower alkoxy group, or a salt thereof.

5. A herbicide containing an effective amount of a compound of the general formula:



wherein R^1 stands for a lower alkyl group; and R^2 stands for a lower alkyl group or a lower alkoxy group, or a salt thereof, and an inert carrier therefor.

4,443,247

PYRIDYLOXY-PHENOXYALKANECARBONYL OXIME DERIVATIVES

Hermann Rempfler, Ettingen, and Werner Föry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

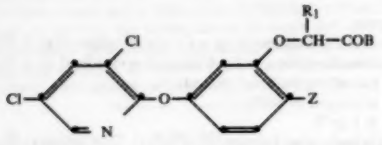
Division of Ser. No. 140,402, Apr. 14, 1980, Pat. No. 4,329,167, which is a continuation-in-part of Ser. No. 80,965, Oct. 1, 1979, abandoned, which is a continuation of Ser. No. 919,119, Jun. 26, 1978, abandoned. This application Mar. 5, 1982, Ser. No. 355,062

Claims priority, application Switzerland, Jun. 29, 1977, 8023/77

Int. Cl.³ C07D *213/64*; A01N *43/40*

U.S. Cl. 71—94 7 Claims

1. A compound of the formula



wherein

Z is chlorine or nitro, R_1 is methyl or ethyl, and B is —O—N=C(C_1–C_4 alkyl)$_2$, cyclohexanonoxime or 2,6-dichlorobenzaldehyde-oxime.

6. A method for controlling weeds at a locus, which comprises applying to said locus a herbicidally effective amount of a compound according to claim 1.

4,443,248

PHENOXYPHENOXYPROPIONIC ACIDS AND DERIVATIVES, AND THEIR USE AS HERBICIDES

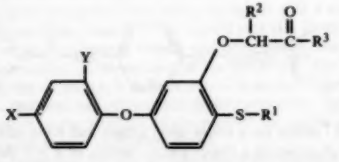
Takeo Hokama, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 12, 1982, Ser. No. 367,642

Int. Cl.³ C07C *149/40*; A01N *37/00, 31/00*; C07C *149/40*

U.S. Cl. 71—98 12 Claims

1. A compound of the formula:



wherein X is selected from the group consisting of halogen, nitro, cyano and trifluoromethyl; Y is selected from the group consisting of hydrogen, halogen, nitro and cyano; R^1 is lower alkyl; R^2 is selected from the group consisting of hydrogen and lower alkyl; and R^3 is selected from the group consisting of hydroxy, lower alkoxy, lower alkylthio, amino, lower alkylamino and di(loweralkyl)amino.

11. A method of controlling weeds which consists essentially of contacting the weeds or the locus of the weeds with a herbicidally effective amount of a composition of claim 9.

4,443,249

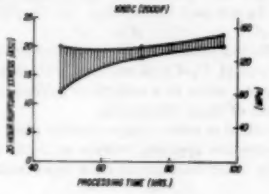
PRODUCTION OF MECHANICALLY ALLOYED POWDER

John H. Weber, Sloatsburg, and Paul S. Gilman, Pomona, both of N.Y., assignors to Huntington Alloys Inc., Huntington, W. Va.

Filed Mar. 4, 1982, Ser. No. 354,884

Int. Cl.³ B22F *9/04*

U.S. Cl. 75—0.5 R 29 Claims



1. A system for controlling the mechanical alloying of at least two solid particulate components, said mechanical alloying being carried out by dry high energy milling of the particles in a gravity-dependent type ball mill to maximize mill throughput and minimize time to processing of the particles to an acceptable processing level, said processing level being suitable for producing a consolidated product with a substantially clean microstructure and having grains which are substantially uniform in size and of a desired shape, comprising milling the particles to produce a powder product characterized in that an optical view at 100× of a representative sample of differentially etched particles milled in said gravity-dependent type ball mill shows the presence of particles having a uniform laminate-type structure, the remaining particles being substantially featureless, the particles with the laminate-type structure having a maximum interlaminar distance no greater than about 50 micrometers.

4,443,250

PROCESS OF PRODUCING SPONGE IRON BY A DIRECT REDUCTION OF IRON OXIDE-CONTAINING MATERIALS

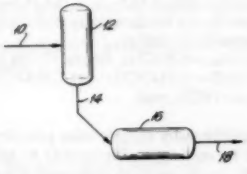
Kurt Meyer; Lothar Reh, both of Frankfurt am Main; Martin Hirsch, Friedrichsdorf; Wolfram Schnabel, Idstein, and Harry Serbent, Hanau, all of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,958

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210232

Int. Cl.³ C21B *13/08*

U.S. Cl. 75—26 11 Claims



1. In a process of producing sponge iron by a direct reduction of iron oxide-containing materials including prereducing a charge in a fluidized bed and final reducing the charge below the melting point of the charge in a rotary kiln, the improvement which comprises prereducing fine-grained materials which contain iron oxide and have an iron content in a fluidized bed to achieve a metallization of 50 to 80% of the iron content of the iron oxide of the fine grained materials and,

thereafter, completely reducing the prereduced fine-grained materials in a rotary kiln.

4,443,251

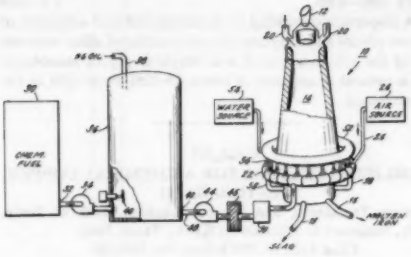
METHOD OF OPERATING A BLAST FURNACE

Theodore J. Reese, P.O. Box 770, Michigan City, Ind. 46360

Continuation-in-part of Ser. No. 313,733, Oct. 22, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,984

Int. Cl.³ C21B *5/00*

U.S. Cl. 75—42 **12 Claims**



1. In a method of operating a blast furnace to melt therein iron ore mixed with coke and limestone to produce and discharge molten iron and slag at the bottom of the furnace, and to discharge carbon dioxide at the top of the furnace, the improvement which comprises the step of introducing into the lower portion of the furnace under pressure a fluid combustible waste material and oxygen wherein said waste material comprises a pumpable low viscosity suspension of solids in liquid hydrocarbons having a heat of combustion of 10,500 to about 19,500 BTU per pound, a chlorine content of about 0.1–5% and substantially no free water.

4,443,252

PROCESS FOR PRODUCING STEEL IN A CONVERTER FROM PIG IRON AND FERROUS SCRAP

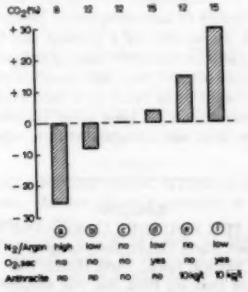
Pieter J. Kreijger, Castricum, and Gerardus P. Bührmann, Velsen-Zuid, both of Netherlands, assignors to Hoogovens Groep B.V., Netherlands

Filed Mar. 16, 1983, Ser. No. 475,973

Claims priority, application Netherlands, Mar. 26, 1982, 8201269

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—48 **9 Claims**



1. In a process of producing steel in a converter, wherein the starting materials comprise pig iron and ferrous scrap and wherein oxygen is blown from above upon the molten metal bath in the converter, the improvement of the combination of the following process steps:

(a) of blowing oxygen into the bath through a first orifice, and of passing inert gas through the bottom of the converter into the bath during at least part of the time of blowing oxygen,

(b) during at least part of the time of blowing oxygen into the bath through a first orifice, blowing oxygen through a second orifice into the atmosphere above the bath,

(c) at least once during the time of blowing oxygen into the bath, adding carbon to the reaction from above.

4,443,253

RECOVERY OF ZINC FROM ZINC CONTAINING SULPHIDIC MATERIALS

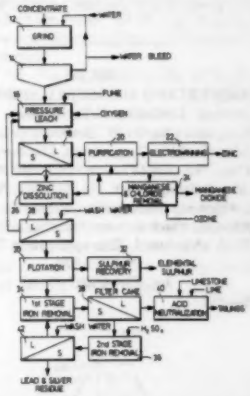
Donald R. Weir, and Ian M. Masters, both of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Filed Sep. 14, 1982, Ser. No. 417,829

Claims priority, application Canada, Jun. 3, 1982, 404390

Int. Cl.³ C22B *19/00*; **C01G** *5/00, 21/00*; **C01B** *17/027*

U.S. Cl. 75—120 **12 Claims**



1. A process for recovering zinc from zinc-containing sulphidic material also containing iron and from zinc oxide containing material, at least one of the zinc containing materials also containing at least one of the metals selected from the group consisting of lead and silver, the process comprising leaching zinc-containing sulphidic material under pressurized oxidizing conditions at a temperature in the range of from about 130° to about 170° C. in aqueous sulphuric acid solution with an initial stoichiometric excess of sulphuric acid relative to the zinc content of the sulphidic material to form a leach slurry containing dissolved zinc and iron, continuing the leach step until a substantial amount of zinc has been dissolved from the sulphidic material, injecting zinc oxide containing material into the leach slurry while maintaining said said pressurized oxidizing conditions and temperature to raise the pH of the slurry to a value in the range of from about 4.5 to about 5.5 to precipitate dissolved iron and form an iron-containing residue and a relatively iron-free leach solution, said residue also containing sulphur and said at least one metal, separating the residue from the leach solution, treating the leach solution to recover zinc, separating elemental sulphur and unreacted zinc containing material from the residue, and leaching the remaining residue in aqueous sulphuric acid solution in an iron removal step to dissolve iron and form a residue enriched in said at least one metal.

4,443,254
COBALT FREE MARAGING STEEL

Stephen Floreen, Suffern, N.Y., assignor to Inco Research & Development Center, Inc., Suffern, N.Y.

Filed Oct. 31, 1980, Ser. No. 202,674
Int. Cl.³ C22C *38/06, 38/08, 38/12, 38/14*
U.S. Cl. 75—123 B **4 Claims**

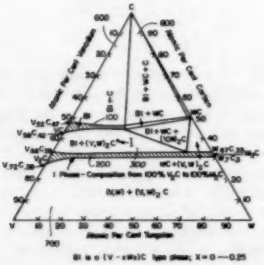
1. A maraging steel characterized by a combination of strength, ductility and toughness as determined by the charpy-V-notch impact test, the CVN impact energy level being at least 10–15+ ft/lbs, said steel consisting of about 17 to 19% nickel, about 1 to 4% molybdenum, about 1.25 to 2.1% titanium, the constituents molybdenum and titanium being correlated such that when the molybdenum content is below about 1.5% the titanium content is at least 1.8% and when the titanium content is below about 1.4% the molybdenum content is at least 2.25%, up to 0.3% aluminum, carbon present up to 0.03%, and the balance essentially iron.

4. A maraging steel characterized, in the absence of cobalt, by a high yield strength on the order of 240,000–250,000+ psi together with, at such strength levels, good toughness as determined by the charpy-V-notch impact test, the CVN impact energy level being at least about 10–15+ ft/lbs at the strength level of 240,000 psi, said steel consisting of about 17% to 19% nickel, about 2% to 3.5% molybdenum, about 1.25% to about 1.7% titanium, a deoxidizing amount of aluminum up to about 0.15%, up to about 0.03% carbon, and the balance essentially iron.

4,443,255
HARD FACING OF METAL SUBSTRATES

Harry J. Brown, Lewiston, N.Y.; William D. Forgeng, Las Vegas, Nev., and Charles W. Brown, Lewiston, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 159,447, Jun. 13, 1980, Pat. No. 4,312,894, which is a division of Ser. No. 885,943, Mar. 13, 1978, abandoned, which is a continuation of Ser. No. 698,848, Jun. 23, 1976, abandoned, which is a continuation of Ser. No. 472,048, May 21, 1974, abandoned. This application Nov. 9, 1981, Ser. No. 319,324
Int. Cl.³ C22C *29/00*
U.S. Cl. 75—251 **2 Claims**



1. A hard facing material for deposition onto the surface of an iron or steel substrate at molten temperatures which comprises a finely divided particulate composition of chemically combined vanadium and carbon having tungsten in solid solution, said composition consisting essentially of (i) at least one vanadium carbide, (ii) tungsten in solid solution with each vanadium carbide in said composition in an amount from about 10% by weight up to about 67% by weight, and (iii) at least one material selected from the group of nickel, cobalt and iron in an amount up to about 50% by weight of said composition, the aggregate amount of all vanadium carbides in said composition being at least about 10% by weight of said composition, said composition containing not more than about 5% by weight of a material selected from the group of uncombined carbon, tungsten, tungsten carbide, vanadium and mixtures thereof.

4,443,256
ALUMINUM FLAKE DISPERSIONS

Jozef T. Huybrechts, Oud Turnhout, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 364,926, Apr. 2, 1982, abandoned, which is a continuation-in-part of Ser. No. 254,458, Apr. 15, 1981, abandoned. This application Aug. 31, 1982, Ser. No. 413,299
Int. Cl.³ C09D *5/08*
U.S. Cl. 106—1.05 **2 Claims**

1. A dispersion consisting of aluminum flakes in a mixture of ethylene glycol and ethylene glycol monobutyl ether wherein each of the ethylene glycol and ethylene glycol monobutyl ether is present in amounts of about 40–60% by weight of the two combined.

4,443,257
STABILIZING MIXTURE FOR A CHEMICAL COPPER PLATING BATH

Francesco Tomaiuolo, and Mauro Bocchino, both of Turin, Italy, assignors to Alfachimici S.p.A., Turin, Italy

Filed Feb. 15, 1983, Ser. No. 466,658
Claims priority, application Italy, Mar. 9, 1982, 67272 A/82
Int. Cl.³ C23C *3/02*
U.S. Cl. 106—1.23 **19 Claims**

1. In an aqueous solution for electroless autocatalytic copper plating, containing a source of cupric ions, a source of hydroxylic ions, a reducing agent, and a complexing agent in such a quantity as to render soluble the cupric ions in an alkaline medium, the improvement comprising a stabilizing mixture of allylthiourea, at least a ferrocyanide of an alkali metal or of ammonium ion, and at least an octylphenylether of ethylene polyoxide with 9–10 moles of ethylene oxide for each mole of octylphenol, the said three stabilizing components mutually exerting a synergical action.

4,443,258
FIRE RETARDANT MATERIALS

William J. Kirkhuff, Irvine, Calif., assignor to Kirkhuff, Shield & Fink, Santa Ana, Calif.

Continuation-in-part of Ser. No. 214,220, Dec. 8, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 343,880
Int. Cl.³ C09D *5/18, 1/00*
U.S. Cl. 106—18.12 **21 Claims**

1. A fire retardant material which comprises:
a quantity of a permeable mass of silica glass;
a quantity at least equal to the weight of said permeable mass of glass of the unexpanded form of heat expandable perlite, said quantity of said unexpanded perlite present as a multiplicity of particles of a particle size less that 100 mesh, said particles permeated among and associated with said permeable mass of glass, said particles being of a size sufficiently small to be retained in said association with said permeable mass of glass upon conversion of said composition from said unexpanded form when subjected to heat.

4,443,259
COATING FOR FOUNDRY CORES AND MOLDS

Robert A. Nooden, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.

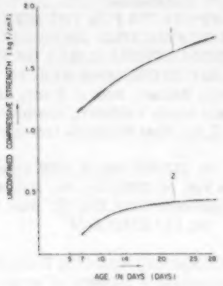
Filed Dec. 10, 1982, Ser. No. 449,098
Int. Cl.³ B28B *7/36*
U.S. Cl. 106—38.27 **6 Claims**

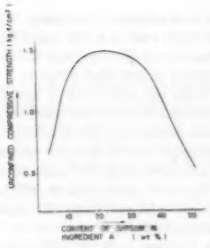
1. A coating for foundry cores and molds comprising an aqueous suspension of clay, olivine, and sodium tripolyphosphate.

4,443,260
METHOD FOR STRENGTHENING SOFT SOIL

Hajime Miyoshi, Koganei; Etsuo Asanagi, Kashiwa; Junsuke Iguchi, and Ikuo Okabayashi, both of Yamato, all of Japan, assignors to Chiyoda Chemical Engineering & Constr., Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1982, Ser. No. 388,146
Int. Cl.³ C04B 7/02, 7/35; E01C 7/36; C04B 11/00
U.S. Cl. 106—109 4 Claims





1. A method for improving the strength of a water-saturated soft soil:

premixing 5–45% by weight particulate gypsum and 55–95% by weight of a water-granulated iron blast furnace slag having a particle size of 1–100 μm to obtain a first homogeneous admixture (A) of slag particles and gypsum particles;

then admixing said first admixture (A) with the soft soil to obtain a second homogeneous admixture; and then

admixing (B) a Portland cement with said second admixture in an amount to provide a weight ratio of said first admixture (A) to said Portland cement (B) within the range of 75/25 to 55/45, whereby the period of time required to obtain a homogeneous mix with the soil is less than when the slag is premixed with the cement.

4,443,261
METHOD OF PREPARING GYPSUM ARTICLES

Sune Nordqvist, Handen, Sweden, assignor to Tenax Maskin AB, Handen, Sweden

Continuation of Ser. No. 190,867, Feb. 22, 1980, abandoned. This application Sep. 8, 1982, Ser. No. 416,024
Int. Cl.³ C04B 11/00
U.S. Cl. 106—109 4 Claims

1. A method of preparing solidified calcium sulfate dihydrate comprising:

adding potassium sulfate to a water slurry of calcium sulfate dihydrate in an amount of at least 5% by weight of the calcium sulfate dihydrate; and

solidifying the said solution while maintaining the solution at a temperature below 70° C.

4,443,262
LOW DENSITY FIBROUS SHEET MATERIAL

Jay L. Piersol, and Frank J. Koller, Jr., both of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 30, 1982, Ser. No. 429,332
Int. Cl.³ C08L 5/00; D02G 3/00
U.S. Cl. 106—209 7 Claims

1. A method of forming a low density fibrous composition, which method comprises (1) forming an aqueous mixture comprising fibers, an anionic detergent and a cationic guar gum derivative, (2) adding borax to the mixture to thereby form a precipitate in which the guar gum derivative is deposited on the fibers, and (3) drying the precipitate to thereby form the low density fibrous composition.

4,443,263
SOLIDS DISPERSIONS WHICH CAN BE EASILY DISTRIBUTED IN HYDROPHOBIC AND HYDROPHILIC MEDIA AND ARE STABLE TO FLOCCULATION, AND THEIR USE

Erwin Dietz; Michael Maikowski, both of Kelkheim, and Robert Gutbrod, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 98,755, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 856,188, Nov. 30, 1977, abandoned. This application May 10, 1982, Ser. No. 376,556
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1976, 2654598
Int. Cl.³ C09K 3/00; C08K 3/04
U.S. Cl. 106—287.24 17 Claims

1. A dispersion of a solid having acidic groups on its surface in a liquid medium, said solid constituting 5 to 80% by weight of said dispersion, and said medium consisting essentially of

(a) a fatty amine constituting 0.2 to 8% by weight of said dispersion and having the formula

wherein R^1 is an aliphatic, araliphatic or cycloaliphatic radical, having a chain of from ten to twenty-five carbon atoms containing up to three carbon-carbon double bonds or said chain substituted by hydroxy, and wherein R^2 and R^3, which are the same or different, is each hydrogen or an aliphatic, araliphatic or cycloaliphatic radical of from one to thirty carbon atoms or is a group of the formula

$$-(CH_2)_n-OH \text{ or}$$

$$-(CH_2)_n-NH_2$$

in which n is from one to six with the proviso that at least one or two of R^1, R^2 and R^3 is an alkyl or alkenyl residue of from ten to twenty-five carbon atoms;

(b) a nonionic surfactant selected from the group consisting of an adduct of 5 to 20 moles of ethylene oxide onto an alkylphenol and of an adduct of 5 to 20 moles of ethylene oxide onto a fatty alcohol, or a mixture thereof, or an anionic surfactant selected from the group consisting of an alkylsulfate, alkylsulfonate and alkylbenzene sulfonate, or a mixture thereof, or a combination of said nonionic and anionic surfactants, these surfactants constituting 3 to 25% by weight of said dispersion and having one or more aliphatic chains with a total of more than 5 carbon atoms and

(c) a water miscible organic solvent constituting 10 to 85% by weight of said dispersion.

4,443,264

HALOGEN-FREE ZINC FERRITE YELLOW PIGMENTS CONTAINING ALUMINA AND PHOSPHORUS OXIDE AND PRODUCTION

Franz Hund; Willi Hennings; Horst Brunn; Peter Kresse, and Wolfgang Rambold, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,002

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136276

Int. Cl.³ C04B *31/02*

U.S. Cl. 106—292 **8 Claims**

1. A halogen-free zinc ferrite pigment consisting essentially of, by weight, about 99.8 to 90% of $ZnFe_2O_4$ and about 0.2 to 10% of the component system $(1-x)Al_2O_3$ and xP_2O_5 wherein $0.25<x<0.95$.

4,443,265

CERAMIC COLOR BODY

Robert Fischer, Obertshausen, and Heinz D. de Ahna, Egelsbach, both of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 16, 1982, Ser. No. 418,844

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 3140914

Int. Cl.³ C09C *1/00*

U.S. Cl. 106—306 **6 Claims**

1. In a ceramic pigment consisting essentially of a colorless matrix and at least one color furnishing compound which is embedded as discrete particles in the matrix material or are bound in the matrix lattice as color furnishing ions the improvement that the matrix consists essentially of mixed alkaline earth metal phosphates, there being present at least 10 mole % of each alkaline earth metal based on 100 mole % of all the alkaline earth metals present in the phosphates wherein the matrix consists essentially of calcium-magnesium phosphates or barium-magnesium phosphates.

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CONTINUOUSLY OPERATING SUGAR CENTRIFUGE

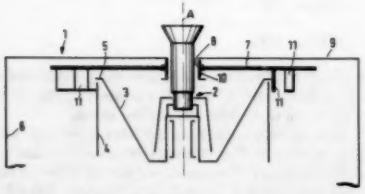
Helmut Schaper, Braunschweig, and Heinrich Kurland, Lucklum, both of Fed. Rep. of Germany, assignors to Braunschweigische Maschinenbauanstalt AG, Braunschweig, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,615

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129392

Int. Cl.³ C13F *1/06*

U.S. Cl. 127—19 **14 Claims**



1. In a continuously operating sugar centrifuge having a conical centrifugal drum with a wide upper end and a liquid collecting housing and a sugar crystal collecting housing in which housings said drum is mounted for rotation, said upper end of the drum forming a sugar discharge flange surrounded by sugar baffle means secured to a rotatable means (7), the improvement comprising a plurality of planar, thin, elastic, springy sheet metal members (11) forming said baffle means, axis means (14) for rotatably securing said sheet metal members (11) to said rotatable means (7), and means for adjusting the angular position of said sheet metal members (11) relative to the direction of a flight path (12) of a sugar crystal flying off said sugar discharge flange (5) for reducing mechanical damage to the sugar crystals.

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METHOD AND APPARATUS FOR THE CONTINUOUS SEPARATION OF FRUCTOSE FROM GLUCOSE STARTING FROM INVERT SUGAR OR FROM ISOMERIZED GLUCOSE SYRUPS

Paolo Pansolli; Aurelio Barbaro, both of Rome; Adriano Maimone, Guidonia, and Mario Valdiserri, Monterotondo, all of Italy, assignors to E.N.I. Ente Nazionale Indrocarburi, Rome, Italy

Continuation of Ser. No. 213,654, Dec. 5, 1980, abandoned. This application Feb. 16, 1983, Ser. No. 466,846

Claims priority, application Italy, Feb. 22, 1980, 20105 A/80

Int. Cl.³ C13D *3/14*

U.S. Cl. 127—46.2 **3 Claims**

1. A method of continuously separating fructose from glucose in a system comprising a plurality of serially interconnected columns each containing an anion-exchange resin in bisulfite form, said method, in steady state conditions, comprising:

(a) introducing a feed mixture containing fructose and glucose into the bottom end of a first one of said columns;

(b) occluding a fraction of glucose from said feed mixture on said resin contained in said first column;

(c) withdrawing from the upper-end of said first column an effluent comprising a fructose-enriched mixture;

(d) introducing said fructose-enriched effluent mixture withdrawn from the upper end of the first and each successive column to the bottom end of the next successive column;

(e) occluding on the resin contained in each successive column a fraction of glucose from the fructose-enriched mixture introduced thereinto;

(f) recycling the fructose-enriched effluent mixture withdrawn from the upper end of the last of said columns to the first of said columns as a feed mixture for step (a);

(g) repeating steps (a) through (f) until the effluent mixture of one of said columns comprises essentially a solution of fructose;

(h) collecting said fructose solution;

(i) repeating steps (a)–(g) until one of said columns is saturated with glucose;

(j) bypassing said glucose saturated column from said system until said glucose is eluted therefrom thereby regenerating said resin in said column for further use in said system; and

(k) eluting glucose solution from said glucose-saturated column.

4,443,268

PROCESS FOR REMOVING COPPER AND COPPER OXIDE ENCRUSTATIONS FROM FERROUS SURFACES

Thomas G. Cook, Burlington County, N.J., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1981, Ser. No. 320,815

Int. Cl.³ C23G *1/08, 1/20*

U.S. Cl. 134—2 **12 Claims**

1. In the process for removing copper and copper oxide-containing encrustations from ferrous metal surfaces by contacting the surfaces with an aqueous alkaline cleaning solution containing a ferric chelate(s) of an alkylenepolyamine polyacetic acid and/or soluble chelating aminated or ammoniated salt(s) thereof in amounts and under conditions sufficient to dissolve said copper and copper oxide-containing encrustations, the improvement comprising adding aqueous hydrogen peroxide to said cleaning solution at a rate such that the solution electro-

motive force, as measured at about 80° F. (platinum vs. a saturated calomel electrode), becomes more positive than about −250 millivolts in less than about one hour.

4,443,269

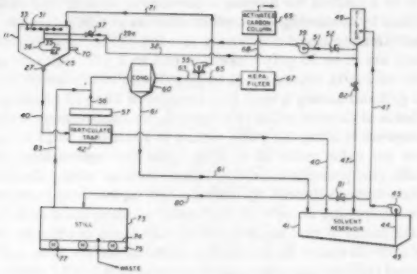
TOOL DECONTAMINATION METHOD

Joseph A. Capella, Crystal River, and David E. Fowler, Gainesville, both of Fla., assignors to Health Physics Systems, Inc., Gainesville, Fla.

Continuation-in-part of Ser. No. 80,474, Oct. 1, 1979, abandoned. This application Jan. 22, 1981, Ser. No. 228,971

Int. Cl.³ B08B *3/02, 15/00*

U.S. Cl. 134—12 **8 Claims**



7. The method for cleansing radioactively contaminated articles in a chamber in which the articles are manipulated therethrough during the cleaning steps so as to facilitate the dislodging and dissolving of the contaminants while simultaneously exhausting air from the chamber, the chamber being coupled to a solvent recirculation circuit, all defining a system wherein solvent is sprayed onto the articles in the chamber at a first elevated pressure at low volume, and recirculated and cleansed of contamination at a second substantially lower pressure in order to reduce the high pressure forces otherwise contained within the chamber and recirculation circuit of the system and thus enhance safety during cleansing by subjecting the parts thereof to less stress, comprising the steps of:

spraying a radioactively contaminated article in a closed chamber with a liquid solvent under a first elevated pressure and during which a portion of the pressurized solvent becomes vaporized upon entry into the expanded volume of the chamber;

withdrawing the contaminated liquid-vapor solvent under a second, substantially lower pressure than said first elevated pressure and conducting the solvent under said lower pressure to a particulate trap where macroscopic particles are removed from the solvent while simultaneously reducing pressure surge in the chamber;

chilling the vaoor component of the solvent to liquify it and conducting the liquified solvent to a reservoir while conducting residual vapor back to the chamber;

conducting solvent at such second and lower pressure from said reservoir through a filter system to cleanse said solvent, thus insuring both integrity of the filter and the liquid character of the solvent so as to thereby reduce the possibility of escape of radioactive contaminant from the chamber and circuit; and

conducting a part of the solvent stream emanating from said filter into a high pressure pump to supply solvent thereafter to said first elevated pressure low volume spray in said chamber while the balance of the solvent emanating the filter is returned at said second lower pressure to the solvent reservoir.

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RINSE AID COMPOSITION

Daniel Biard, Böhl-Iggelheim, Fed. Rep. of Germany, and Rainer Lodewick, Meise, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 12, 1982, Ser. No. 397,329

Claims priority, application United Kingdom, Jul. 17, 1981, 8122039

Int. Cl.³ A47L *15/44;* **B67C** *1/04;* **C11D** *1/66, 3/04*

U.S. Cl. 134—25.2 **2 Claims**

1. In a process for rinsing tableware in an automatic dishwashing machine wherein the rinse solution contains a low foaming ethoxylated nonionic surfactant to reduce spotting on washed and dried tableware and said rinse solution contains 50 ppm or less of water hardness measured as $CaCO_3$ and has a pH close to neutral, wherein the improvement comprises the addition of a source of water-soluble Mg^{++} or Zn^{++} ions to said rinse solution with said low foaming ethoxylated nonionic surfactant whereby corrosion of glass arising from the presence of chelating agents in automatic dishwashing detergent compositions or in automatic dishwashing rinse aid compositions is substantially eliminated.

4,443,271

METHOD FOR CLEANING FLOOR GRATES IN PLACE WITH HIGH PRESSURE WATER JETS

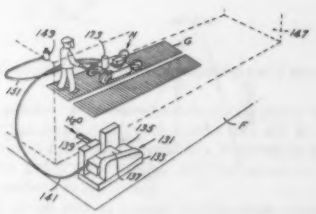
William G. Goerss, Fenton, Mich., assignor to NLB Corp., Wixom, Mich.

Continuation of Ser. No. 145,392, May 1, 1980, Pat. No. 4,337,784, which is a division of Ser. No. 934,756, Aug. 21, 1978, Pat. No. 4,219,155. This application Apr. 28, 1982, Ser. No. 372,514

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—34 **1 Claim**



1. In a method for removing overspray paint from floors, floor grates or other surfaces by supporting high pressure water nozzles mounted within a hollow spray enclosure and discharging a stream of water under high pressure up to 10,000 psi through said water nozzles towards a selected surface, the steps comprising:

directing said stream of high pressure water downwardly through a vertical bore within a fixed spindle mounted to said hollow spray enclosure and into a plurality of radial discharge ports at the lower end of said vertical bore;

surrounding said fixed spindle with a rotatable tubular body having an annular water chamber in close proximity to said radial discharge ports and means for rotatably driving said tubular body, said annular water chamber receiving said downwardly directed stream of high pressure water and directing said stream of high pressure water radially outward through a plurality of angularly disposed water nozzles mounted to and rotatable with said tubular body whereby high pressure water jets impinge onto the surface;

permitting movement of high pressure water between said rotatable tubular body and said fixed spindle to thereby

lubricate the rotative movement of said tubular body on said spindle;

directing said stream of high pressure water through a valve means which is connected to said vertical bore and to an opening in said hollow spray enclosure, and passing water at reduced pressure through said valve means and said opening down into said hollow spray enclosure only when said tubular body is not rotated and when said valve means is in a first position, and directing a small amount of water to said vertical bore at very low pressure only when said tubular body is not rotated and said valve means is in its first position;

selectively driving said tubular body on said fixed spindle thereby rotating said water nozzles, said driving means operably connected to said valve means for shifting said valve means to a second position to close said opening when said driving means is rotatably driving said tubular body, and supplying said entire stream of high pressure water to said vertical bore and to said nozzles when said driving means is rotatably driving said tubular body and said valve means is in its second position; and

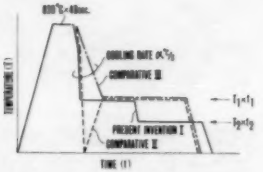
movably transporting said rotating nozzles and water jets over and along the selected surface for forcefully and operatively impinging upon the surface.

4,443,272

PROCESS FOR PRODUCING COLD ROLLED STEEL SHEETS HAVING EXCELLENT PRESS FORMABILITY AND AGEING PROPERTY

Hiroshi Katoh; Hiromi Toyota; Kazuo Koyama, and Kunihiko Komiya, all of Chiba, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 9, 1982, Ser. No. 416,372
Claims priority, application Japan, Sep. 19, 1981, 56-148323
Int. Cl.³ C21D *8/04*
U.S. Cl. 148—12 C **9 Claims**



1. A process for producing cold rolled steel strips having excellent press formability and ageing property, comprising:

continuously casting molten steel containing carbon, manganese, phosphorus, aluminum, nitrogen and boron;

the carbon being not more than 0.1%,

the manganese being not more than 0.5%,

the phosphorus being not more than 0.01%,

the aluminum being not more than 0.08%,

the nitrogen being not more than 0.005%,

the boron being present in an amount not over 0.005%,

with the balance being iron and unavoidable impurities, into steel slabs;

continuously hot rolling the slabs with a finishing temperature not lower than A_3 point, and a coiling temperature from 600° to 750° C.;

cold rolling the hot rolled strips thus obtained;

then subjecting the cold rolled strips thus obtained to continuous annealing which comprises heating the strips to a temperature ranging of from 680° to 850° C., cooling the strips with a cooling rate not less than 30° C./sec. through a temperature range of from A_1 point to a temperature ranging of from 450° to 350° C., holding the strips at the temperature thus cooled for one to 3 minutes, further cooling the strips to a temperature ranging of from 300° to 200° C., holding the strips at a temperature for at least one minute, and cooling the strips to room temperature.

4,443,273

METHOD FOR REPLENISHING CHEMICAL IN ZINC PHOSPHATE TREATMENT

Koichi Saito, Teramachi Oike Agaru Nakagyo-ku Kyoto-Shi 604; Yasutake Mino, 1-17, Fukaeminamimachi Higashinada-ku Kobe-Shi 658; Nobuo Nakatani, 1-4-31-201, Motoyamanakamachi Higashinada-ku Kobe-Shi 658, and Ryoichi Murakami, 82-1 Hokkeji-cho, Nara-Shi 630, all of Japan

Filed Dec. 21, 1981, Ser. No. 332,700
Claims priority, application Japan, Dec. 26, 1980, 55-186023
Int. Cl.³ C23F *7/10*
U.S. Cl. 148—6.15 Z **6 Claims**

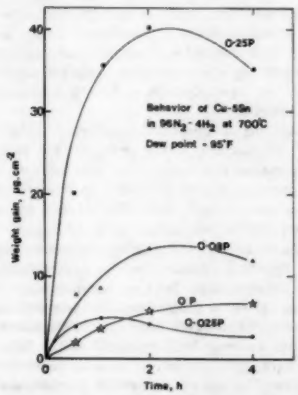
1. In a method for forming a conversion coating on a metal surface by immersing said metal surface in an acidic zinc phosphate treating liquid comprising zinc ion (0.5 to 1.5 g/l), phosphate ion (5 to 30 g/l), nickel ion (0.5 to 2 g/l), chlorate ion (0.05 to 2 g/l), nitrate ion (1 to 10 g/l) and nitrite ion (0.01 to 0.2 g/l) and having a total acid titration of 14 to 25 points and a free acid titration of 0.2 to 1.5 points, the improvement which comprises treating the metal surface at a rate of 3 to 15 m^2 per hour per cubic meter of treating liquid and replenishing said acidic zinc phosphate treating liquid, without testing the bath concentrations thereof, by adding a first replenishing composition comprising about 0.10–0.31 moles of phosphoric acid, 0.1 to 0.2 moles of zinc ion and 0.05 to 0.20 moles of chlorate ion for each 10 square meters of treated metal surface area, and a second replenishing composition comprising 0.2 to 0.8 moles of nitrite ion for each 10 square meters of treated metal surface area.

4,443,274

PROCESS FOR FORMING A PROTECTIVE FILM ON CU-SN ALLOYS

Andrew J. Brock, Cheshire, and Frank N. Mandigo, Northford, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Dec. 3, 1982, Ser. No. 446,758
Int. Cl.³ C23F *7/12*
U.S. Cl. 148—6.31 **5 Claims**



1. Process for forming a protective layer on a surface of a copper-tin alloy containing phosphorous comprising: providing an alloy comprising about 2.5% to about 15% tin, about 0.05% to about 1.5% phosphorous and the balance consisting essentially of copper, forming tin oxide on the surface of said alloy and reducing said tin oxide by heating said alloy at a temperature in the range of about 700° C. to about 900° C. in a

reducing atmosphere having a dew point of at least about 65° F. for a time sufficient to transform said tin oxide initially into globules of tin containing phosphorous and then into a substantially continuous protective layer of tin-phosphorous oxide.

4,443,275

METHOD OF PRODUCING A MAGNETIC GATE

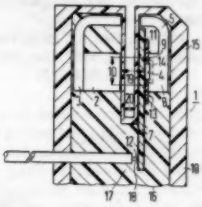
Wilhelm Ertl, Ottobrunn; Ulrich Lachmann, and Heinrich Pertsch, both of Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Division of Ser. No. 225,686, Jan. 15, 1981, Pat. No. 4,394,190. This application Sep. 30, 1982, Ser. No. 431,874

Claims priority, application Fed. Rep. of Germany, Jan. 18, 1980, 3001771

Int. Cl.³ H01L *43/06*; G01R *33/12*

U.S. Cl. 148—31.55 **1 Claim**



1. Method of producing a magnetic gate having a semiconductor chip, a thin intermediate carrier having contact points, finger-like structures, a magnetically permeable metal piece having a first part with a pole shoe having cutout formed therein and a second part, a synthetic material plate having contact structures and external connecting wires connected at outer ends of the contact structures, and a pre-fabricated housing having an interior space formed therein, which comprises soldering the semiconductor chip as a miniaturized package to the intermediate carrier with the finger-like contact structures, attaching the intermediate carrier to the pole shoe, soldering the synthetic material plate to the corresponding contact points of the intermediate carrier, fastening the magnet to the first part of the magnetically permeable metal piece, separately inserting the magnet with the first part of the magnetically permeable metal piece, and the intermediate carrier connected to the second part of the magnetically permeable metal piece, the semiconductor chip and the synthetic plate into the prefabricated housing, and filling the interior space of the housing with a poured insulator covering the connection between the external connecting wires and the synthetic plate.

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MN—AL—C ALLOYS FOR ANISOTROPIC PERMANENT MAGNETS

Susumu Sanai, Hirakata, and Kiyoshi Kojima, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

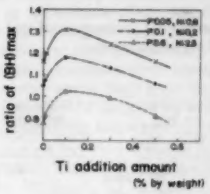
Filed Dec. 28, 1982, Ser. No. 453,955

Claims priority, application Japan, Jan. 12, 1982, 57-3918

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—31.57 **4 Claims**

1. In an anisotropic permanent magnet comprising an Mn—Al—C alloy comprising manganese of 68.0 to 73.0% by weight, carbon of (1/10Mn—6.6) to (⅛Mn—22.2)% by weight and the remainder aluminum, said alloy having been subjected to warm plastic deformation, said alloy being characterized in that said alloy contains phosphorus in an amount of X% by weight wherein the value of X is $0.005 \leqq X \leqq 0.6$, all percentages being based on 100% of the total weight of manganese, aluminum and carbon.



4,443,277

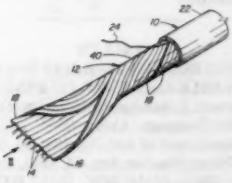
METHOD OF MAKING A TELECOMMUNICATIONS CABLE FROM A SHAPED PLANAR ARRAY OF CONDUCTORS

Bernard E. Rokas, Ormeaux, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Sep. 23, 1982, Ser. No. 422,021

Int. Cl.³ H01B *13/10*

U.S. Cl. 156—50 **13 Claims**



1. A method of making a telecommunications cable comprising:

disposing a plurality of insulated conductors together into a conductor group in which the conductors are in open planar array in a direction normal to a longitudinal direction of the group and retaining the conductors in their relative positions in the group;

shaping the group into an arcuate configuration around a longitudinal axis with the conductors extending in the general direction of the axis; and

providing a layer of insulation extending around the axis and surrounding the group in its arcuate configuration.

4,443,278

INSPECTION OF MULTILAYER CERAMIC CIRCUIT MODULES BY ELECTRICAL INSPECTION OF GREEN SPECIMENS

Arthur R. Zingher, Elmsford, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 26, 1981, Ser. No. 267,272

Int. Cl.³ B32B *31/12, 31/16, 31/28*

U.S. Cl. 156—64 **32 Claims**

13. In a method of manufacture of ceramic laminated electron substrates comprising,

applying a past to a number of unfired ceramic sheets, said paste including conductive particles and an insulating material,

and then assembling sheets into complete assemblies,

then laminating by compression,

then sintering and

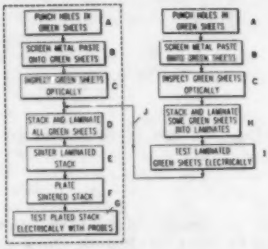
then planting to form the finished substrate,

the improvement comprising the steps performed prior to

the step of assembling of said unfired ceramic sheets into complete assemblies, said steps including

placing at least one of said unfired sheets in a device for electrically inspecting the parameters of the pattern formed by said paste upon said sheets,

comparing thus measured parameters of said pattern with a predetermined set of parameters,



rejecting sheets having improper electrical parameters,

retaining sheets having a proper set of parameters,

thereby avoiding the waste attendant with employing sheets with improper electrical parameters,

wherein said inspecting step is performed by a mechanical contact method wherein contacts are applied to said sheet prior to assembly.

4,443,279

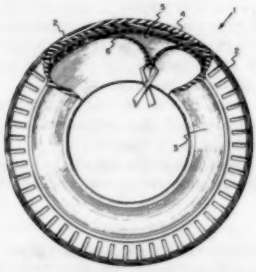
PNEUMATIC RUBBER TIRE HAVING CO-CURED, REMOVABLE OR REMOVED INNER LINER

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 184,856, Sep. 8, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 293,051

Int. Cl.³ B29H *17/14;* **B60C** *19/12;* **B32B** *31/00*

U.S. Cl. 156—123 **1 Claim**



1. A method of preparing a pneumatic rubber tire which comprises applying a sulfur-containing uncured butyl rubber strip to a building form over which the remainder of the elements of the rubber pneumatic tire are built thereby providing a sulfur curable rubber interface of the uncured tire with the said strip in the crown region of the tire, following which the resulting assembly is coated on its inside surface with a release agent, the assembly placed in a tire mold and shaped and the tire and said strip covulcanized together to provide cured adhesion between said strip and tire inner surface with the aid of heat and pressure and expanded inner bladder, deflating the bladder and removing the tire from the mold following which the sulfur covulcanized, initially applied, butyl rubber strip is removed from the inside of the tire to provide a resultant pneumatic tire having a fresh, clean, exposed inner surface; where said first applied butyl rubber strip is removed as a covulcanized, sulfur cured rubber admixture comprised of (A) about 60 to about 90 parts by weight butyl rubber and correspondingly, (b) about 40 to about 10 parts by weight of an ethylene/propylene/nonconjugated diene terpolymer and contains about 2 to about 10 parts by weight tackifier resin for said EPDM and butyl rubbers with a softening point in the range of about 50° C. to about 110° C. prepared by polymerizing a mixture of piperylene and at least one methyl branched α-olefin containing 5–6 carbon atoms; where said butyl rubber has a molecular weight in the range of about 200,000 to about 400,000; where said cured rubber strip has a thickness in the range of about 0.025 to about 0.25 cm, and has a covulcanized adhesion to the tire's inner cured rubber surface of less than about 1.8 kg per linear cm and a tack value in the range of about 10 to about 30 Newtons.

4,443,280

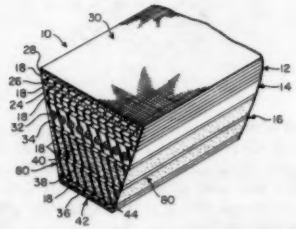
METHOD OF MAKING AN ENDLESS POWER TRANSMISSION BELT

Paul M. Standley, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 104,616, Dec. 17, 1979, Pat. No. 4,299,588. This application Sep. 30, 1981, Ser. No. 307,056

Int. Cl.³ B29H *7/22*

U.S. Cl. 156—137 **4 Claims**



1. In a method for constructing a raw edge, endless power transmission belt which comprises the steps of sequentially winding a plurality of layers around a rotatable mandrel assembly to form a belt sleeve, wherein at least one of said layers is a fabric layer and at least one other of said layers is composed primarily of elastomeric material, vulcanizing the resulting belt sleeve and cutting a plurality of belts from the vulcanized sleeve, the improvement comprising the steps of forming a further layer of elastomeric material having pyrolytic graphite particles dispersed substantially uniformly therethrough and being oriented therein so that the long axes of said graphite particles substantially extend in the same direction, and winding at least one said further layer around said mandrel assembly so as to be disposed between two layers in said sleeve and so that the long axes of the pyrolytic graphite particles are oriented in the direction of the rotational axis of said building mandrel whereby said particles will be adapted to conduct heat to the raw side edges of the belts subsequently cut from said belt sleeve.

4,443,281

METHOD OF MAKING AN ARCHED ENDLESS BELT

Joseph P. Miranti, Jr., Nixa, Mo., assignor to Dayco Corporation, Dayton, Ohio

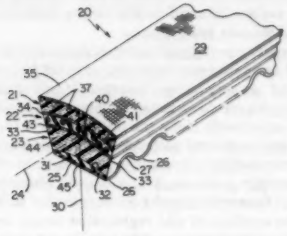
Filed Feb. 6, 1981, Ser. No. 232,326

Int. Cl.³ B29H *7/22*

U.S. Cl. 156—140 **22 Claims**

1. In a method of making a plurality of polymeric raw-edged endless power transmission belts, said method comprising the steps of, disposing in tubular form a plurality of uncured belt defining layers around a belt building drum, said layers defin-

ing corresponding sections of said belts, curing said layers in a controlled environment to define a belt sleeve, cooling said sleeve, and cutting said sleeve to define said raw-edged belts, the improvement in said method enabling the making of said belts as arched belts and comprising the steps of providing a plurality of shaping means each having a precontoured outer surface and each being made of uncured gum material, wrapping a plurality of said shaping means around said belt building drum prior to said disposing step so that said outer surfaces thereof are disposed in axial spaced apart relation and face outwardly from said drum, causing said plurality of shaping means to cooperate with said controlled environment during



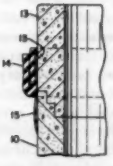
said curing step to define a corresponding plurality of integral axially spaced arched belt defining portions in said layers and sleeve without substantially changing the transverse cross-sectional profiles of said precontoured outer surfaces of said shaping means, and causing each associated shaping means to be cured and bonded to said layers during said curing step so as to define the inner portion of an associated arched belt defining portion, said cutting step comprising the step of cutting said sleeve on opposite sides of associated shaping means to define an associated arched belt with said cured gum shaping means thereof serving as a crack barrier for the inner portion of its associated arched belt.

4,443,282

METHOD OF EXTERNALLY SEALING SEWAGE SYSTEM JOINTS AGAINST ENTRY OF GROUND WATER TO THE SYSTEM

Bruce L. Stachitas, 4500 Dustin Rd., Burtonsville, Md. 20730

Filed Apr. 30, 1982, Ser. No. 373,526
Int. Cl.³ B32B *31/00*; B28C *19/00*
U.S. Cl. 156—152 **3 Claims**



1. The method of preventing entry of ground water into a sewage system through joints between adjacently interconnected large diameter tubular elements thereof comprising:

(a) placing an elastomeric band about a first one of the elements prior to its interconnection with the adjacent element,

(b) interconnecting the adjacent element to said first element,

(c) positioning the elastomeric band so that it substantially equally overlies the joint between said first and second elements with one-half of the band width overlying each element,

(d) folding the elastomeric band back upon itself from one of said elements and applying a mastic coating to the surface of the element thereby exposed and folding the band back over the element and mastic coating,

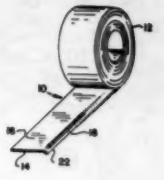
(e) thereafter folding the elastomeric band back upon itself from the other adjacent element and applying a mastic coating to the surface of the adjacent element thereby exposed and folding the band back over the element and mastic coating to form an externally sealed joint between two adjacent interconnected sewage system elements having an elastomeric band about the joint adhered to the adjacent members of the joint by a mastic to repel ground water from entering the sewage system externally.

4,443,283

PAINT SHIELD ROLL

Ira Sarkisian, 14180 Pennsylvania, Southgate, Mich. 48195

Division of Ser. No. 76,367, Sep. 17, 1979, Pat. No. 4,263,355.
This application Dec. 16, 1980, Ser. No. 217,106
Int. Cl.³ B32B *3/04*; B05C *21/00*
U.S. Cl. 156—211 **2 Claims**



1. A method of making a paint strip shield, said method comprising providing a roll of a relatively thin resilient strip of non-brittle highly pliable plastic material, said strip having a uniform thickness comprised between about 0.010 in. and 0.060 in. and being laterally flat when rolled in said roll, forming a longitudinal score line proximate and parallel to a longitudinal edge of said strip prior to rolling said strip in said roll, said score line being formed by a shallow groove defining a guide line of reduced strength, said strip having a width of at least three inches, said shallow groove being formed on one surface of said strip at a distance of about one-half inch to about one inch from said longitudinal edge, unrolling a length of said strip from said roll, cutting off said length of said strip, and manually bending over an edge flange along said shallow groove for providing said length of said strip substantially with an L-shape in cross-section, said edge flange being disposed at an angle comprised between 90 degrees and 145 degrees to the flat wide portion of said strip, and placing said length of said strip along a junction of a wall and a floor with said longitudinal edge at the junction of said wall and floor for protecting said floor during painting of said wall.

4,443,284

LEAD SADDLE ASSEMBLY AND APPARATUS FOR FORMING

Paul S. Bandurski, Palatine, Ill., assignor to Cam Fran Tool Co., Inc., Bensonville, Ill.

Filed Nov. 2, 1981, Ser. No. 317,246
Int. Cl.³ B29C *27/04*; B30B *15/34*
U.S. Cl. 156—212 **19 Claims**

1. A method of forming a lead saddle assembly having a plurality of insulated wire leads disposed in a side-by-side array, comprising the steps of:

providing a welding assembly comprising welder means defining gripper means for holding said wire leads in said array,

dispensing a first tape strip onto said welder means,

placing said wire leads in said gripper means in said array over said first tape strip,

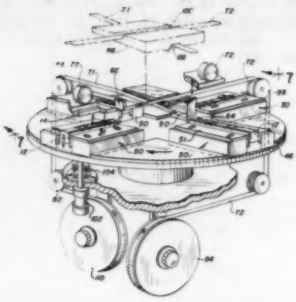
dispensing a second tape strip onto said welder means after said first tape strip and after said wire leads have been placed in said welder means in said array, and

energizing said welding assembly for joining said first and second tape strips so that said wire leads are maintained in said array.

16. An apparatus for forming a lead saddle assembly having a plurality of insulated wire leads having non-fusible insulation, said leads being disposed in a side-by-side array, comprising:

a plurality of first welding elements having wire gripping means each being adapted to hold a set of said plurality of wire leads in said array,

indexing means comprising a rotatable turntable supporting each of said welding elements for movement of each first welding element between a first loading and a second welding station,



first tape feed means for dispensing a first tape strip onto that one of said elements which is at said loading station before said wire leads are disposed on said gripping means,

second tape feed means for dispensing a second tape strip onto a welder element while that welder element is at said welding station and after said wire leads are disposed on said gripping means, and

means for joining said first and second tape strips at said welding station comprising a second welding element, means for moving said welding elements toward each other for urging said first and second tape strips into contact with each other, and means for heating said tape strips for joining them to maintain said wire leads in said array.

4,443,285

TAPERED ARTICLE LABELLING MACHINE AND METHOD

William F. Roth, and Nevin Snyder, both of Hanover, Pa., assignors to New Way Packaging Machinery, Inc., Hanover, Pa.

Filed Jun. 8, 1982, Ser. No. 386,253
Int. Cl.³ B65C *3/12, 9/04*
U.S. Cl. 156—215 **10 Claims**

1. A tapered article labelling machine operable to receive, reposition, space, accelerate, and thereafter compressively engage and forward at a high-speed circumferentially rotated displacement for automatic label application processing a successive stream of curved and tapered frusto-conical articles respectively having a peripheral sidewall surface in turn respectively enclosably supporting a top rim and a bottom rim structurally disposed in a plannar parallel spaced relationship one to the other, said machine comprising in combination:

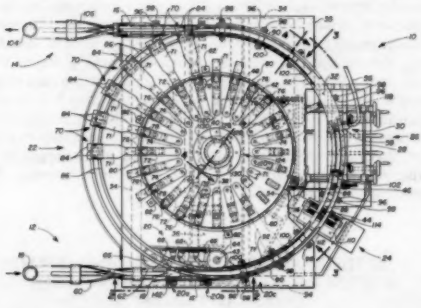
a. a support frame having interconnected horizontal and vertical members adapted to mount a horizontally disposed turntable rotationally driven by a motor through an interconnecting vertically disposed turntable drive shaft assembled the radial center axis of said turntable,

b. an infeed end provided with an infeed delivery twist chute adapted to up-end turn each respective curved and tapered frusto-conical article of said successive stream from a top rim upward facing horizontal disposition to a top rim turntable radial center axis outward facing vertical disposition for arcuate peripheral sidewall surface circumferential rotary motion transport upon a tapered article arcuate guide track provided with a tapered article registration means therealong in effecting label application processing displacement therefrom to a delivery end,

c. a tapered article pick-up and spacing station adapted to receivably engage said up-end turned tapered articles successively from said infeed delivery twist chute and acceleratedly space the same in an extendible relationship one to the other in continued forward feeding peripheral sidewall surface circumferential rotary motion transport upon said arcuate guide track,

d. a rotationally operational radial arm conveyor assembly mounted upon said turntable and adapted by a camming means and a cooperative inverted V-belt compression means to progressively engage concurrently said tapered articles respectively along the up-end turned top rim and bottom rim peripheral surfaces thereof and circumferentially rotate said acceleratedly spaced articles along said tapered article guide track at a constant high-speed displacement forwarding to the delivery end of said machine within the confines of said registration means therealong,

e. an adhesive application station positioned along said tapered article arcuate guide track intermediate said infeed end and said delivery end and adapted to apply between said top rim and said bottom rim to the external circumferential sidewall surface respectively of each of a curved and tapered frusto-conical article in the succession comprising said stream an adhesive, and



f. a label application station positioned along said tapered article arcuate guide track intermediate said adhesive application station and said delivery end and adapted to automatically present and apply between the top rim and the bottom rim a label to the external circumferential adhesived sidewall surface respectively of each of said curved and tapered frusto-conical articles during continued constant high-speed radial arm conveyor assembly circumferential rotary motion and transport thereof.

10. A method of labelling curved and tapered frusto-conical articles, said method comprising first conveyably repositioning said articles from a top rim and a bottom rim horizontal plane disposition to a top rim and a bottom rim vertical plane disposition for access presentment of the tapered sidewall surface thereof for label application processing and thereafter engaging and sequentially spacing apart respectively in an extended rotation displacement circumferentially about the curved and tapered sidewall surface thereof along an arcuately configured guide track with an individual curved and tapered article from a like successive contiguously abutted stream thereof sequentially delivered thereto, second accelerating each of said sequentially spaced apart individual curved and tapered articles

to a constant high-speed circumferentially rotated displacement forwarding along said arcuately configured guide track, next applying an adhesive material to the external circumferential sidewall surface between the top rim and the bottom rim of each of said constantly high-speed circumferentially rotated curved and tapered articles during continued forwarding displacement respectively thereof along said arcuately configured guide track, and thereafter followed by circumferentially rotational engagement and adhered external circumferential sidewall surface wrapping of a label upon said curved and tapered article between the top rim and the bottom rim thereof by means of said adhesive material previously applied thereto.

4,443,286

METHOD OF MAKING CUSHION MATERIAL FROM FOAM SLABS AND COMMINUTED SOFT FOAM SCRAP

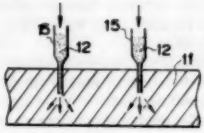
Hisashi Ikeda, Yokohama, and Yuuichi Hosoda, Hamakita, both of Japan, assignors to Ikeda Bussan Co., Ltd., Yokohama, Japan

Division of Ser. No. 226,315, Jan. 19, 1981. This application Nov. 19, 1981, Ser. No. 322,798

Claims priority, application Japan, Jan. 23, 1980, 55-7248; Feb. 23, 1980, 55-22619; Oct. 1, 1980, 55-137443; Dec. 12, 1980, 55-175497

Int. Cl.³ B32B *5/18*; B29D *27/00*

U.S. Cl. 156—245 **17 Claims**



1. A method of making a cushion material, which comprises:

forming a plurality of cushion layers made of a plurality of polyurethane foam slabs in piles cut in a predetermined form;

applying between said polyurethane foam slabs at selected portions thereof varying amounts of a solidifiable bonding agent, greater amounts being applied at portions which are to be relatively harder or retained in a deformed configuration and lesser amounts being applied at portions which are to be relatively softer; and

inserting said cushion layers in a pair of forming dies and compressing said layers therein to solidify said bonding agent, and to shape said cushion layers into a form along an inner shape of said forming dies.

4,443,287

METHOD OF MANIPULATING PRINTED PRODUCTS AND MEANS AND APPARATUS FOR PERFORMANCE THEREOF

Guido Worni, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Mar. 27, 1981, Ser. No. 248,238

Claims priority, application Switzerland, Apr. 10, 1980, 2743/80

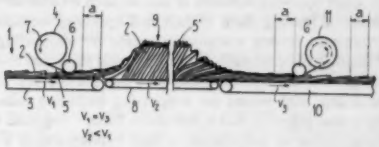
Int. Cl.³ B32B *31/00, 31/12, 31/26*

U.S. Cl. 156—247 **4 Claims**

1. A method of manipulating sheet-like products, especially printed products, specially newspapers and periodicals, comprising the steps of:

fixing the products in a single operating step in a defined formation at a flexible traction element provided with a heat sealable material having a latent adhesion property by activating said adhesion property by applying heat;

altering the defined formation of the products during manipulation thereof while maintaining a given order of the products; and



then detaching the traction element from the products by neutralizing its adhesion property by the application of heat.

4,443,288

METHOD AND APPARATUS FOR FUSING TOGETHER THERMOPLASTIC SYNTHETIC RESIN MOLDED ARTICLES

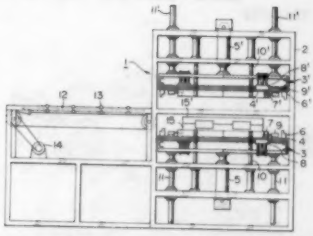
Susumu Sawada, Machida; Yoshikazu Yoshida, Koganei, and Minoru Tanaka, Kawasaki, all of Japan, assignors to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,582

Claims priority, application Japan, Aug. 26, 1981, 56-133842

Int. Cl.³ B29C *19/00*

U.S. Cl. 156—304.6 **14 Claims**



1. In a method of fusing together thermoplastic synthetic resin molded articles wherein said molded articles to be fused together are held in spaced opposed relation by holding means, a heating plate normally held at a position on one side of a space between said opposed molded articles is inserted into said space, said molded articles are moved toward said heating plate to be urged thereto by a moving means to melt confronting surfaces of said molded articles, moving said molded articles away from said heating plate with said moving means, retracting, said heating plate out of said space via a drive means, and then said molded articles are abutted and fused together at molten confronting surfaces, the improvement which comprises the steps of supporting said holding means in a manner such that gaps are formed between said holding means and said moving means before separating said molded articles from said heating plate, limiting said gap such that a percussive force is applied to said holding means by movements of said moving means so as to quickly separate said molded articles from said heating plate.

4. In apparatus for fusing together thermoplastic synthetic resin molded articles of the type comprising a pair of opposing press boards, a pair of holding means provided on opposing sides of said press boards for respectively holding said molded articles, a heating plate, drive means for advancing and retracting said heating plate into and out of a space between said holding means, and moving means for urging against and separating said molded articles away from said heating plate, the improvement wherein each of said holding means comprises a floating plate mounted on each said press board to be movable in the direction of movement thereof, and a holding member for securing said molded article to said floating plate

and there is provided spacer means mounted between said floating plate and said heating plate for maintaining a predetermined distance between said floating plates and said heating plate when opposing surfaces of said molded articles are urged against said heating plate to melt said opposing surfaces, said improvement further comprising means for supporting each said floating plate on each said press board such that each said floating plate can separate from each said press board so as to form a gap, said means for supporting including means for limiting said gap such that a percussive force is supplied to said holding means by movements of said moving means so as to quickly separate said molded articles from said heating plate.

4,443,289

LABELING MACHINE FOR OBJECTS SUCH AS BOTTLES

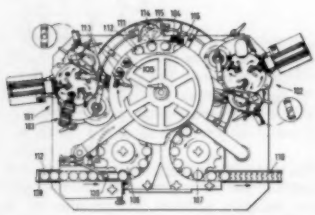
Wilhelm Kölges, Meerbusch, and Rudolph Zodrow, Düsseldorf, both of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Düsseldorf, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 427,245

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149886

Int. Cl.³ B65C *9/16, 9/46*

U.S. Cl. 156—384 **7 Claims**



1. In a machine for labeling objects such as bottles, comprising a gluing station, a label supply station, a label transfer station and a label marking station, a turntable which moves the objects on controlled revolving platforms past the stations, the label transfer station having at least one label pickup element provided with a convexly curved pickup surface and mounted and driven on a revolving carrier in a rotating or rocking movement by means of a shaft disposed at a fixed distance from the carrier axis between the pickup surface and the center of its curvature so that upon each rotation of the carrier the pickup surface of the pickup element rolls against the uppermost label of the label supply station and against the other stations, the label marking station having an inking station and at least one marking type disposed in a convexly curved field, which type is inked at the inking station upon rotation of the carrier, the label-bearing pickup surface of each pickup element rolling on the inked type, the improvement which comprises providing applicator means within or directly behind the transfer area of the label transfer station, the applicator means applying the transferred label, without contacting the printed portion, to the object in such manner that the label adheres to the object as transport continues, a radiation source directly following the section of the transport path with the applicator means and positioned adjacent the path of movement of the objects with its radiation aimed at the objects, and control means for the rotating platforms so as to hold the objects in a position in which their imprinted area faces the radiation from the radiation source.

4,443,290

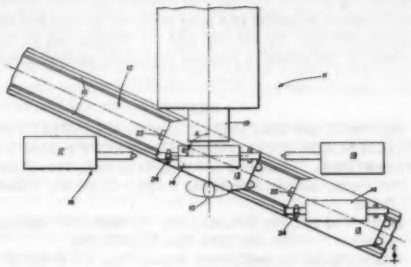
WORK STATION

Earl F. Loeffler, Uniontown; Stephen R. Barrickman, Tallmadge, and John A. Johnsen, Wadsworth, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jun. 8, 1982, Ser. No. 386,373

Int. Cl.³ B29H *17/00*

U.S. Cl. 156—396 **14 Claims**



1. In an automated tire assembly apparatus having a plurality of tire building drums which are transported by a conveying means and which tire building drums are adapted to be engaged by a drive unit in order that tire components may be applied to said tire building drum by a component applicator, the improvement comprising:

an angular relationship between the axis of the tire building drum and the direction of movement of said conveying means of 20 to 40 degrees.

4. An apparatus for applying components to a tire building drum comprising:

(a) a drive unit having a drive headstock and a support tailstock adapted to grasp and rotate said tire building drum about a first axis between said headstock and said tailstock;

(b) component applicator means disposed proximate to said tire building drum which tire building drum is supported between said headstock and said tailstock wherein the axis of application of said applicator means is perpendicular to said first axis;

(c) tire building drum conveying means having its axis of travel between 20 and 40 degrees from said first axis.

4,443,291

FLYING SPLICE APPARATUS

Barrie T. Reed, 4200 NW. 35th Ct., Miami, Fla. 33142

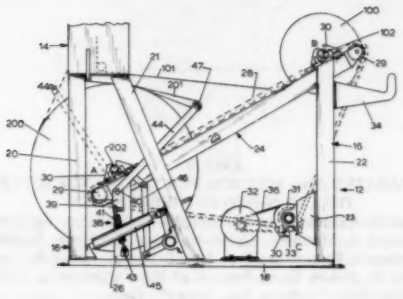
Filed Apr. 15, 1981, Ser. No. 254,280

Int. Cl.³ B65H *19/12, 21/00*

U.S. Cl. 156—504 **12 Claims**

9. A splicing apparatus for making uniform splices comprising a roll stand frame and a splicer assembly mounted on said roll stand frame, said roll stand frame comprising a base, a plurality of upright members extending from said base, a material roll conveyor assembly means mounted to said upright members, said conveyor assembly means comprising a plurality of inclined support members secured to said upright members, a plurality of sprockets mounted on each of said inclined support members, said sprockets together with at least one sprocket mounted on said roll stand frame being provided with an endless chain mounted thereon, said endless chain being driven by motor means which drives one of said sprockets and said chain, a plurality of shaft gripping members mounted on said endless chain, said shaft gripping members being provided with two separate sections which are separated to provide a widened saddle area adapted to grasp the shaft of a roll of material, and a moveable tensioned arm member adapted to engage the leading edge of a web of a replacement roll to form

a web loop, said arm member being tensioned by spring means connected thereto to bias said arm member in one direction and cylinder means connected to said arm member by linkage means adapted to drive said arm member in the opposite direction from the spring bias, said splicer assembly comprising a plurality of upstanding side members secured to said roll stand frame, a plurality of idle rollers mounted to said side members, a rotatable vacuum member mounted to said side members, a



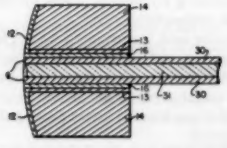
knife back up bar slidably mounted within at least one of said side members and adapted to engage another side member, and a clamping and cutting means rotatably mounted to said side members, said cutting and clamping means having frame means comprising a plurality of moveable support members, each of said support members being moveably mounted to said side members, a connecting member secured to and connecting said moveable support members, and means to transport said support members to move said clamping and cutting means.

4,443,292

WEAR RESISTANT ELECTRODE HEAD FOR ELECTROGRAPHIC PRINTERS

Kishor M. Lakhani, and Jerry L. Ligon, both of Oklahoma, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Division of Ser. No. 259,889, May 4, 1981, Pat. No. 4,399,447.
This application Mar. 14, 1983, Ser. No. 474,923
Int. Cl.³ C23F *1/02*; B05D *1/02*; G01D *15/06*
U.S. Cl. 156—634 **7 Claims**



1. A method of making an electrode head assembly for use in electrographic printing comprising the steps of:

(a) etching a plurality of longitudinal copper styli on a substrate of polyimide glass with only the ends exposed thus forming a first assembly;

(b) assembling first and second solid metal head bars, each head bar having six congruent rectangular surfaces so that a first face surface of the first head bar is parallel to a second face surface of the second head bar and separated by a thin shim, said first and second face surfaces being longitudinal to said electrode head assembly and comprise the interface surfaces of said electrode head assembly, said interface surfaces also being at right angles to third and fourth face surfaces of said first and second solid metal bars;

(c) spray coating said third and fourth face surfaces with a thin coating of molybdenum making an intimate bond therewith;

(d) removing said thin shim and separating said first and second face surfaces;

(e) spray coating said first and second face surfaces with a thin coating of alumina making an intimate bond therewith;

(f) grinding said molybdenum and alumina faces;

(g) assembling said electrode head assembly by sandwiching said first assembly between said first and second face surfaces; and

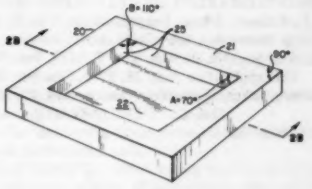
(h) intimately bonding said first and second face surfaces to said first assembly.

4,443,293

METHOD OF FABRICATING TRANSDUCER STRUCTURE EMPLOYING VERTICALLY WALLED DIAPHRAGMS WITH QUASI RECTANGULAR ACTIVE AREAS

Joseph R. Mallon, Franklin Lakes, and Anthony D. Kurtz, Englewood, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 255,468, Apr. 20, 1981, Pat. No. 4,359,498.
This application Jul. 19, 1982, Ser. No. 399,422
Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—647 **4 Claims**



1. A method of fabricating a diaphragm having a rectangular recess defining an active area comprising the steps of:

(a) masking a major surface of a rectangular wafer of single crystal semiconductor of a given crystallographic orientation with a rectangular pattern;

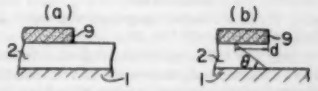
(b) anisotropically etching said pattern according to said orientation to provide a rectangular recess having steep sidewalls manifesting an active diaphragm area.

4,443,294

PROCESS FOR FORMING MAGNETIC FILM PATTERN

Masahide Suenaga; Yukihisa Tsukada, both of Odawara, and Hiroshi Yamamoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,578
Claims priority, application Japan, Jun. 10, 1981, 56-88168
Int. Cl.³ C23F *17/00*; H05K *3/06*
U.S. Cl. 156—656 **14 Claims**



1. A process for forming a magnetic film pattern, which comprises:

forming a permalloy film on a substrate,

forming a mask on the permalloy film with a photoresist,

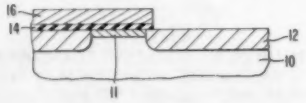
etching the side edges of the permalloy film into a gradually reduced state of film thickness with an etching solution containing $FeCl_3$, HCl and H_3PO_4.

4,443,295

METHOD OF ETCHING REFRACTORY METAL FILM ON SEMICONDUCTOR STRUCTURES UTILIZING TRIETHYLAMINE AND H_2O_2

Kenneth J. Radigan, Mountain View, and James M. Cleeves, Redwood City, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Jun. 13, 1983, Ser. No. 503,976
Int. Cl.³ H01L *21/308*
U.S. Cl. 156—657 **8 Claims**



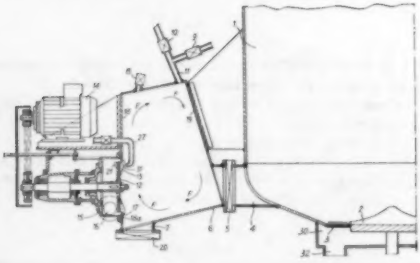
8. A method of etching a tungsten-titanium layer on semiconductor structure comprising subjecting it to a mixture of triethylamine and hydrogen peroxide.

4,443,296

PROCESSES AND DEVICES FOR THE DISINTEGRATION OF CELLULOSE MATERIALS

Jean P. Lamort, Vitry, France, assignor to E et M Lamort (Societe Anonyme), Vitry le Francois, France

Division of Ser. No. 90,985, Nov. 5, 1979, Pat. No. 4,369,093. This application Aug. 25, 1980, Ser. No. 180,673
Claims priority, application France, Nov. 17, 1978, 78 32549
Int. Cl.³ D21C *5/00, 5/02*
U.S. Cl. 162—52 **5 Claims**



1. A method of intermittently processing refusals rejected by a pulp discharge sieve of a pulping machine, comprising the steps of:

periodically extracting a predetermined volume of a mixture of pulp and refusals from the machine upstream of and in the vicinity of the discharge sieve;

transferring the extracted volume of mixture to an enclosed chamber via a first conduit;

closing the first conduit by means of a valve located in the first conduit;

separating the extracted volume of mixture in the chamber into a cleansed pulp suspension and refusals by agitation of the extracted volume within the chamber with a means for stirring the volume;

recharging the pulping machine with said suspension via a second conduit;

introducing water into the enclosed chamber via a third conduit to dilute the suspension until the pulp content falls below a predetermined value;

pressurizing said enclosed chamber with gas via means for releasably pressurizing said chamber;

emptying the dilute suspension from the enclosed chamber under gas pressure through said second conduit while continuing the agitation so that the dilute suspension washes the chamber walls; and

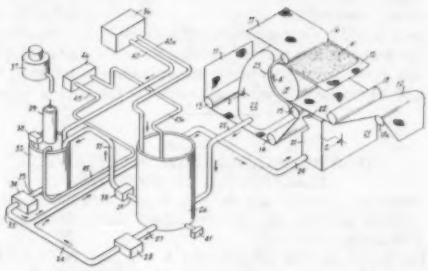
discarding the refusals from the bottom of the enclosed chamber through an outlet means for opening the bottom of the chamber.

4,443,297

APPARATUS AND METHOD FOR THE MANUFACTURE OF A NON-WOVEN FIBROUS WEB

James O. Cheshire, Neenah; Douglas L. Lindgren, Appleton; Robert J. Marinack, Oshkosh; Bruce W. Janda, Neenah; Robert S. Thut, Green Bay; John T. Larkey, Green Bay, and Ray E. Jostad, Green Bay, all of Wis., assignors to James River-Dixie/Northern, Inc., Norwalk, Conn.

Division of Ser. No. 179,229, Aug. 18, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,738
Int. Cl.³ D21D *3/00;* D21F *1/66*
U.S. Cl. 162—101 **9 Claims**



1. A method for making up a foamed fiber furnish for the production of non-woven fibrous web on a moving foraminous support which comprises:

a. preparing a foamable liquid comprising water and a surface active agent;

b. passing said foamable liquid in the substantial absence of fibers to and through said moving foraminous support web forming means whereby foam is formed in said liquid by entrainment of air therein producing a foamed liquid;

c. collecting foamed liquid passing through said foraminous support;

d. storing said collected foamed liquid for a period of time sufficient to permit said foamed liquid to stratify into an upper frothy layer and a lower more dense layer of foamed liquid;

e. recirculating said more dense layer of said foamed liquid to and through said foraminous support until said more dense layer of said stored foamed liquid contains from about 55 to about 75 percent air by volume and is capable of supporting and transporting fibers as a dispersion therein;

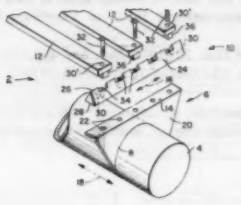
f. forming a foamed fiber furnish by dispersing fibers in said foamed liquid from step (e); and

g. supplying said foamed fiber furnish to said foraminous support for the production of said non-woven fibrous web.

4,443,298
CONTROLLED TURBULENCE HYDROFOIL BLADE SUPPORT MEMBER

Benjamin A. Thorp, 7 Ball Ct., Albany, N.Y. 12204

Filed Mar. 8, 1982, Ser. No. 355,315
Int. Cl.³ D21F *1/54*
U.S. Cl. 162—252 **13 Claims**



1. A blade support member for use in a papermaking machine, and blades supported by said support member, wherein said member is positionable upon existing support structure in a forming section of said machine beneath a moveable forming medium, comprising:

a body extendable beneath said forming medium in a longitudinal direction from one side of said papermaking machine to the other for attachment of said support member to existing papermaking machine support structure;

at least two mounting elements attached to said body and extending in a direction transverse to said longitudinal direction and for a short length relative to the overall length of said papermaking machine forming section, one of said mounting elements being attached to said body at said one side and the other of said mounting elements being attached to said body at said other side; and,

means attached to said mounting elements and supporting a plurality of blades, each of said blades extending in said longitudinal direction such that at least one of said blades is moveable in said transverse direction relative to at least one other of said blades and relative to said mounting elements.

2. The blade support member of claim 1 wherein said supporting means comprises a plurality of mounting devices attached to said mounting elements and extending in said longitudinal direction, each of said mounting devices supporting one of said blades, at least one of said mounting devices being moveable in said transverse direction relative to at least one other of said mounting devices and relative to said mounting elements.

13. The blade support member of claim 2 further including means for selectively automatically causing movement of said moveable mounting devices in response to the detection of predetermined conditions.

4,443,299
APPARATUS AND METHOD FOR THE MANUFACTURE OF A NON-WOVEN FIBROUS WEB

James O. Cheshire, Neenah; Douglas L. Lindgren, Appleton; Robert J. Marinack, Oshkosh; Bruce W. Janda, Neenah; Robert S. Thut, Green Bay; John T. Larkey, Green Bay, and Ray E. Jostad, Green Bay, all of Wis., assignors to James River-Dixie/Northern, Inc., Norwalk, Conn.

Continuation of Ser. No. 179,229, Aug. 18, 1980, abandoned. This application May 19, 1982, Ser. No. 380,026
Int. Cl.³ D21F *1/66*
U.S. Cl. 162—264 **4 Claims**

1. Apparatus for making a non-woven fibrous web which comprises:

(a) a fiber stock supply means,

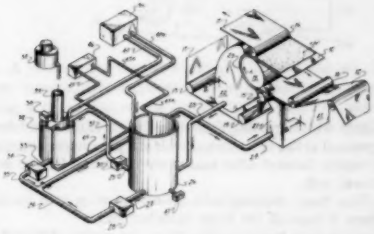
(b) web-forming means comprising a moving foraminous support onto which an aqueous fiber furnish is deposited from a headbox with formation of fibrous web and drainage of aqueous liquid therefrom,

(c) means for forming a foamable aqueous solution of surface active agent,

(d) means for directing said foamable solution directly to said headbox,

(e) means for collecting aqueous liquid passing through said foraminous support comprising foam formed by entrainment of atmospheric air in said liquid passing through said moving foraminous support,

(f) a storage silo for storing said collected foamed aqueous liquid and separation of the foamed liquid into a lower layer of more dense foam containing 55 to 75 percent air by volume in the lower portion of the silo and an upper less dense frothy layer of foam in the upper portion of the silo accompanied by the release of excess air therefrom,



(g) a first means for withdrawing more dense foam from said lower portion of said storage silo and directing said withdrawn foam directly into contact with said foraminous support means,

(h) means for forming a dispersion of fibers in foam comprising a mixing tank,

(i) means for delivering fibers from said fiber stock supply means to said mixing tank,

(j) a second means for withdrawing said more dense foam from said lower portion of said storage silo and directing said withdrawn foam into said mixing tank forming a dispersion of fibers in foam,

(k) means for directing said dispersion of fibers in foam from said mixing tank to said headbox, and

(l) means for blending said dispersion of fiber in foam with said stream of foam passing directly from said storage silo to said headbox.

4,443,300
PAPER MAKING MACHINE WITH A FILTER CYLINDER

Alfred Bubik, Ravensburg, and Siegfried Reutter, Gerbertshaus, both of Fed. Rep. of Germany, assignors to Escher Wyss GmbH, Ravensburg/Württ, Fed. Rep. of Germany

Continuation of Ser. No. 226,228, Jan. 19, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 440,083
Claims priority, application Switzerland, Mar. 18, 1980, 2118/80
Int. Cl.³ D21F *1/48, 1/76*
U.S. Cl. 162—306 **10 Claims**

1. A paper making machine comprising:

a filter cylinder having a pervious surface;

a headbox cooperating with said filter cylinder at a headbox region and serving for forming a fiber web upon said filter cylinder;

a withdrawal web for the direct removal of the fiber web from the filter cylinder;

a plurality of guide rolls;

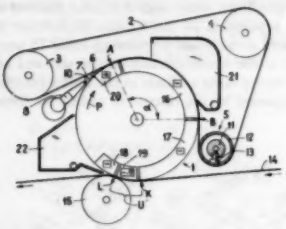
an endless filter band guided over said plurality of guide rolls;

said endless filter band being guided along said filter cylinder and being trained about said filter cylinder at its cir-

cumference over a predetermined wrap angle which extends between a run-on location and a lift-off location for said endless filter band;

said endless filter band being guided from the region of said headbox towards a run-on location for said withdrawal web;

a first suction box extending approximately up to said lift-off location for said filter band for forming a negative pressure and provided for said filter cylinder;



said fiber web departing from the filter cylinder and being deposited at the withdrawal web at a predetermined transfer region located after said run-on location for the withdrawal web;

said filter band defining said lift-off location at a location where it runs-off the filter cylinder; and

a second suction box extending from the region of the lift-off location of the filter band approximately up to a location defining said run-on location of the withdrawal web.

4,443,301

CONTROLLING METAL ELECTRO-DEPOSITION USING ELECTROLYTE CONTAINING TWO POLARIZING AGENTS

Robert C. Kerby, Rossland, Canada, assignor to Cominco Ltd., Canada

Filed Sep. 23, 1982, Ser. No. 422,438
Claims priority, application Canada, Jan. 7, 1982, 393685
Int. Cl.³ C25D *21/12, 21/14*
U.S. Cl. 204—1 T **17 Claims**

1. A method for controlling the electro-deposition of metal using an electrically conductive aqueous electrolyte containing concentrations of two organic polarizing agents including one agent which affects primarily grain refining, and one agent which affects the smoothness and levelness of the metal deposit, which method comprises:

(a) establishing a test cell circuit including at least one test cell; a sample of electrolyte; at least one anode; at least one cathode having a constant area in contact with the electrolyte; at least one reference electrode, a current supply means which is electrically connected to the anode(s) and the cathode(s); and an overpotential measuring means connected between the cathode and the reference electrode;

(b) applying a current in the test cell sufficient to cause electro-deposition of metal;

(c) measuring between a cathode and a reference electrode in a test cell the overpotential associated with the initial deposition or the nucleation of metal deposition onto a clean cathode surface, and termed the nucleation overpotential;

(d) measuring between a cathode and a reference electrode in a test cell the overpotential associated with metal deposition onto previously deposited metal, and termed the plating overpotential;

(e) relating the measured values of the nucleation overpotential, the plating overpotential, and the difference between values of the nucleation and plating overpotentials to previously determined optimum values; and

(f) adjusting the process by changing the concentration of at least one of the organic polarizing agents in the electrolyte to obtain optimum metal deposition conditions when deviations from optimum values occur.

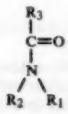
4,443,302

PRINTING MEDIUM AND USE THEREOF

Paul L. Gendler, and Robert Twieg, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,764
Int. Cl.³ B41M *5/20;* **G01D** *15/34*
U.S. Cl. 204—2 **20 Claims**

1. A printing medium which comprises a substrated coated on at least one surface thereof with a compound of the following formula:



wherein R_3 is a ring group having at least one substituent selected from the group of SO_2F, salt thereof, SO_3H, salt thereof, halo, NO_2, aryl, thioalkyl, aralkyl, alkyl, alkaryl, or alkoxy in the ortho position with respect to the atom connected to C═O with the proviso that when R_3 is phenyl, and R_1 and R_2 are interconnected to form together with the nitrogen atom 3,7-bis(dimethylamino)-phenothiazine moiety, then at least one of the substituents on said phenyl is selected from the group SO_2F, thioalkyl, halo, NO_2, aryl, aralkyl, alkyl, alkaryl, or alkoxy; R_1 is aryl group, alkaryl group, or interconnected with R_2 to form together with the nitrogen atom to which it is connected a heterocyclic ring selected from the group of phenothiazine, phenoxazine, or phenazine; and substituted derivatives thereof; and R_2 is aryl group, alkaryl, or interconnected with R_1 to form together with the nitrogen atom to which it is connected a heterocyclic ring selected from the group of phenothiazine, phenoxazine, or phenazine; and substituted derivatives thereof; or mixtures thereof; and coated with an oxidizing agent or the reduced form thereof to catalyze an oxidation of said compound.

4,443,303

METHOD OF MAKNG COLD SHIELD AND ANTIREFLECTOR FOR INFRARED DETECTOR ARRAY AND PRODUCT THEREOF

W. Larry Freeman, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 426,429, Sep. 29, 1982, abandoned. This application Apr. 28, 1983, Ser. No. 489,631
The portion of the term of this patent subsequent to Jul. 5, 2000, has been disclaimed.
Int. Cl.³ C25D *5/02, 7/12;* **G01J** *1/44*
U.S. Cl. 204—15 **4 Claims**

1. A method of applying a cold shield to an array of photodetectors and their associated conductors on one side of a substrate, including the steps of:

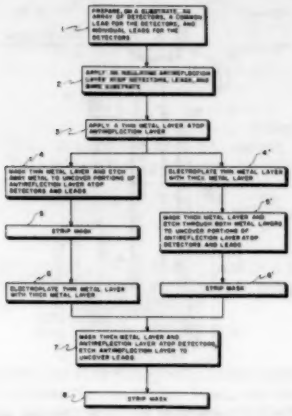
(a) coating said photodetectors, said conductors, and said one side of said substrate with an electrically insulating antireflection layer;

(b) applying a thin metal layer atop said layer;

(c) masking said metal layer and etching the metal layer to uncover portions of the antireflection layer atop the photodetectors and atop portions of the conductors;

(d) stripping the mask;

(e) electroplating a thick metal layer atop said thin metal layers;



(f) masking said thick metal layer and etching to remove the antireflection layer from atop said portions of said conductors and;

(g) stripping the mask.

4,443,304

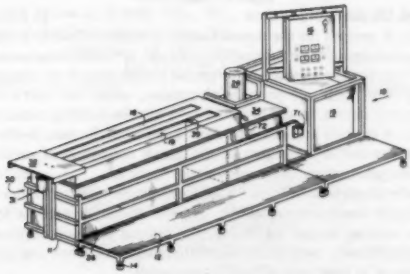
PLATING SYSTEM AND METHOD

Charles D. Eidschun, Clearwater, Fla., assignor to Micro-Plate, Inc., Clearwater, Fla.

Filed Oct. 1, 1982, Ser. No. 432,186

Int. Cl.³ C25D *5/08, 21/20*

U.S. Cl. 204—27 **7 Claims**



1. An electrodeposition system including a cell comprising, in combination,

a plurality of uniformly longitudinally spaced vertical sparger tubes within the plating cell,

a plurality of anode bars positioned adjacent the spargers and a wall of the cell and remote from the central area,

a conductive cathode bar mounted for reciprocation above cell,

means for energizing said cathode bar,

clamp means for securing a printed circuit board in electrical communication and physical communication with and beneath said cathode bar,

means for reciprocating said cathode bar while a printed circuit board is in a plating solution interiorly of each of said plating cell,

and said means for reciprocating being restricted so that movement in substantially one-half the distance between the vertical spargers.

4,443,305

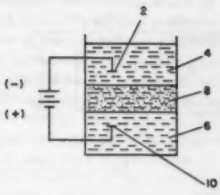
EMULSION ELECTROWINNING

Richard Haynes, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 2, 1983, Ser. No. 490,602

Int. Cl.³ C25C *1/00*

U.S. Cl. 204—59 M **14 Claims**



1. A process for electrowinning a metal from an organic phase including the steps of creating a dispersed phase comprising a dispersion of the organic phase with an immiscible conducting aqueous phase and electrowinning the metal from the dispersed phase.

4,443,306

PROCESS AND CELL FOR THE PREPARATION OF POLYVALENT METALS SUCH AS ZR OR HF BY ELECTROLYSIS OF MOLTEN HALIDES

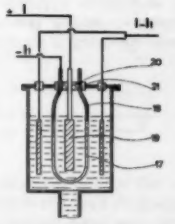
Marcel Armand, Meylan, and Philippe Moinard, Saint Martin d'Heres, both of France, assignors to Pechiney Ugine Kuhlmann, Paris, France

Filed Nov. 16, 1981, Ser. No. 321,624

Claims priority, application France, Nov. 27, 1980, 80 25507

Int. Cl.³ C25C *3/26*

U.S. Cl. 204—64 T **8 Claims**



1. A process to electrolytically produce zirconium or hafnium from chlorides thereof in a bath of molten alkali metal or alkaline earth halides in an electrolytic cell consisting of:

(a) providing above the electrolyte an anodic space defined by a graphite collector;

(b) extending the lower end of the collector below the surface of the electrolyte to form a seal wherein the lower end of the collector is extended by an annular porous wall or diaphragm of polyvalent metal;

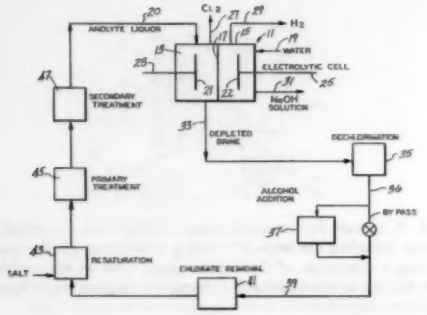
(c) directing a negative current to said collector such that the electrical resistance of the electrolyte impregnating the collector is maintained at a constant value; and

(d) maintaining the value of the electrical resistance of the electrolyte by adjusting the strength of the current directed to the collector as a function of the difference between the potential difference through the electrolyte and a reference potential.

4,443,307
REDUCTION OF AVAILABLE CHLORINE IN ALKALI BRINES

Sanders H. Moore, and Maurice R. Smith, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 21, 1983, Ser. No. 477,091
Int. Cl.³ C25B 1/34
U.S. Cl. 204—98 23 Claims



1. In a process for purifying a depleted alkali metal halide brine recovered for reuse in the production of an alkali metal hydroxide and a halogen by electrolysis in a cell wherein a portion of said halogen dissolves in and reacts with said brine to produce an alkali metal hypohalite, said brine being treated to remove said hypohalite ion prior to being resaturated and returned to said cell, the improvement comprising:

(a) collecting at least a portion of said depleted brine after said brine has been dehalogenated; and

(b) contacting said collected portion with an amount of an organic hydroxyl moiety-containing compound soluble in said brine, the proportion of said compound being equal to at least about 1 mole of said hydroxyl moiety in said compound per mole of alkali metal hypohalite contained in said brine for a residence time sufficient to substantially reduce said alkali metal hypohalite in said brine, said hydroxyl moiety-containing compound being selected from the group consisting of alcohols and saccharides.

4,443,308
METHOD AND APPARATUS FOR SYNTHESIZING ANHYDROUS HNO_3

Clifford L. Coon, Fremont; Jackson E. Harrar, Castro Valley; Richard K. Pearson, Pleasanton, and Raymond R. McGuire, Brentwood, all of Calif., assignors to The United States of America as represented by United States Department of Energy, Washington, D.C.

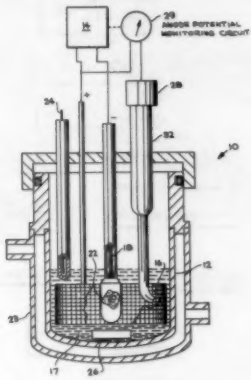
Filed Jul. 20, 1982, Ser. No. 399,946
Int. Cl.³ C25B 1/00, 9/04
U.S. Cl. 204—103 15 Claims

1. A method of dehydrating aqueous HNO_3, comprising:

providing an electrochemical cell including an anode disposed in an anode compartment of said cell, and a cathode disposed in a cathode compartment, said anode and cathode being operatively connected to a power source;

disposing a solution of N_2O_4 and aqueous HNO_3 in said anode compartment;

applying and maintaining a controlled potential of about 1.35 to 2.00 V vs SCE between said N_2O_4/aqueous HNO_3 solution and said anode; and



forming N_2O_5 in anhydrous HNO_3 within said anode compartment.

4,443,309
PROCESS FOR THE DETOXIFICATION OF CHEMICAL WASTE MATERIALS

Pieter J. Van Duin, Noordwijk, and Joost Van Erkel, Rozenburg, both of Netherlands, assignors to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek, The Hague, Netherlands

Filed Nov. 5, 1981, Ser. No. 318,571
Claims priority, application Netherlands, Nov. 25, 1980, 8006412
Int. Cl.³ C02F 1/46
U.S. Cl. 204—149 13 Claims

1. A process for the detoxification of chemical waste materials containing toxic organic compounds, in which substantially all the waste materials are subjected to electrolysis by contacting them with one or more electrodes, which are part of an electric circuit, in the presence of a micelle-forming material.

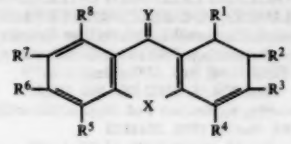
3. A process according to claim 1, wherein the micelle-forming material is a member of the group consisting of methyldodecylbenzyltrimethylammoniumchloride, methyldodecylxylylene-bistrimethylammoniumchloride, octadecyltrimethylammoniumchloride, sodium dodecylbenzenesulfonate, sodium dioctyl sulfosuccinate, sodium perfluoroalkylbenzenesulfonate, octylphenoldecaethyleneglycol ether and mixtures of at least two of these compounds.

4,443,310
PHOTOINITIATED SYNTHESIS OF MERCAPTANS

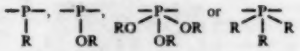
Emmanuel Arretz; Claude Landoussy, both of Pau; Alfred Mirassou, Poey-de-Lescar, and Jean Ollivier, Arudy, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Mar. 10, 1982, Ser. No. 357,068
Claims priority, application France, Mar. 12, 1981, 81 04956; Feb. 22, 1982, 82 02849
Int. Cl.³ B01J 19/12
U.S. Cl. 204—158 R 19 Claims

1. In the process of synthesis of mercaptans by the photochemical reaction of an olefinic compound with hydrogen sulphide in the presence of an initiator, the improvement which comprises employing as the initiator an xanthenic type compound of the formula



where Y is O or S, X is O, S, Se, —CH_2—, —CH_2CH_2—, SO_2, CO, CS or NR′, R′ being a hydrocarbon radical,



where R designates an alkyl, an aryl, an H or a halogen, the symbols R^1 to R^8 individually designating H, halogen, alkoxy, alkyl or aryl.

4,443,311

METHOD FOR MAKING AMINO ACIDS

Norman N. Lichtin, Newton Center, Mass., and Elliot Berman, Los Angeles, Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jul. 22, 1983, Ser. No. 516,066

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—158 R **13 Claims**

1. A method for making amino acids comprising providing a mixture of nitrogen, carbon dioxide and a source of hydrogen, and exposing said mixture to light in the presence of at least one Group VIII metal oxide, said exposure time, and exposure conditions, and the amount of said metal oxide present all being effective to form said amino acids.

4,443,312

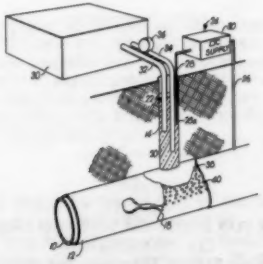
SITU METHOD OF COATING BURIED CONDUCTIVE STRUCTURES

Gary J. Hennon, Kansas City, Mo., assignor to Midwest Research Institute, Kansas City, Mo.

Filed Sep. 14, 1982, Ser. No. 418,062

Int. Cl.³ C25D *13/14*

U.S. Cl. 204—181 R **10 Claims**



1. A method of coating electrically conductive structures buried in the ground comprising the steps of:

providing a passageway extending from the surface of the ground to a level where a portion only of the conductive structure is brought into direct communication with the passageway while the remainder of the structure adjacent the passageway remains buried in the ground and in intimate contact with the surrounding soil;

introducing a quantity of a water dispersion of an ionic organic resin composition into the passageway to form a reservoir thereof in direct contact with said portion of the structure which communicates with the passageway;

establishing a path for flow of electrical current to the reservoir of said resin composition and to said conductive structure respectively; and

impressing direct current on said structure and the resin composition in said reservoir along the electrical paths therefor of a polarity to cause the resin ions in the compositions to migrate electrophoretically to the conductive structure and to react with ions generated from the water at the surface of the structure to insolubilize the resin and effect a coating thereof on the conductive portion of such structure contacted by the resin composition,

said direct current being impressed on the structure and said reservoir of a voltage and amperage level and for a time period to cause sufficient gas to be evolved from the water dispersion of said resin composition at the conductive surface of the structure as the resin is deposited on and coats said portion of the conductive structure, such that the gas assists in displacement of enough soil surrounding the structure to allow the resin composition to contact and coat conductive portions of the structure remote from the passageway and not originally contacted thereby thus increasing the area of the structure coated with said resin.

4,443,313

ELECTROLYTIC REDUCTION CELLS

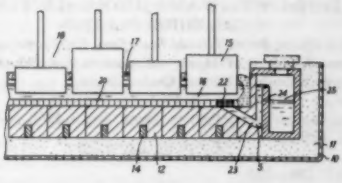
Adam J. Gesing, Kingston, Canada; John McIntyre, Tucson, Ariz.; Meine Vandermeulen, Kingston, Canada; Edward L. Cambridge, Tucson, Ariz., and Thomas P. DeAngelis, Horsehead, N.Y., assignors to Alcan International Limited, Montreal, Canada

Filed Jun. 23, 1982, Ser. No. 391,404

Claims priority, application United Kingdom, Jun. 25, 1981, 8119587

Int. Cl.³ C25C *3/08, 7/02, 7/06*

U.S. Cl. 204—240 **5 Claims**



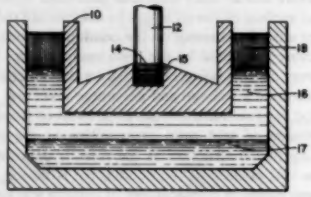
1. An electrolytic reduction cell for the production of a molten metal by electrolysis of a fused electrolyte, which is less dense than the molten product metal, said cell having one or more overhead anodes and a cathodic floor and having a layer of ceramic shapes arranged on said cathodic floor, said shapes being formed of a material which is resistant to attack by said molten metal and said fused electrolyte, is more dense than said product metal and is wettable by said product metal, but is non-wettable by said electrolyte characterised in that said shapes constitute a monolayer of tiles in the form of honeycomb having apertures formed therein, of such dimensions as to restrain electrolyte-coated sludge particles from entry into such apertures.

5. An electrolytic reduction cell according to claim 1, further characterised in that a selective filter is arranged in said cell to permit outflow of molten metal but to restrain flow of molten electrolyte, said filter being arranged to permit passage of molten metal at a rate in excess of its production and being arranged to co-operate with metal level control means located externally of said cell.

4,443,314
ANODE ASSEMBLY FOR MOLTEN SALT ELECTROLYSIS

Duane R. Secrist, Elizabethton; James M. Clark, Johnson City, and Henry E. Grindstaff, Elizabethton, all of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,951
Int. Cl.³ C25C 3/06, 3/12, 3/16
U.S. Cl. 204—243 R 10 Claims

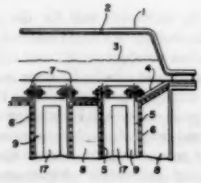


1. A cermet anode connector for use in an electrolytic cell for molten salt electrolysis wherein the anode is selected from the group consisting of cermets and ceramics, said connector having a lower electrical resistivity than said anode at the operating temperature of said cell and no higher than 1×10^{-3} Ω-cm, said connector comprising at least 31% by volume of metal and no more than 69% by vol. of ceramic.

4,443,315
FINGER TYPE ELECTROLYTIC CELL FOR THE ELECTROLYSIS OF AN AQUEOUS ALKALI METAL CHLORIDE SOLUTION

Tokuzo Iijima, Kobe; Yasushi Samejima, Kakogawa, and Toshiji Kano, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 22, 1981, Ser. No. 256,576
Claims priority, application Japan, Jul. 3, 1980, 55-94269[U]; Jul. 3, 1980, 55-94268[U]
Int. Cl.³ C25B 9/00
U.S. Cl. 204—253 4 Claims

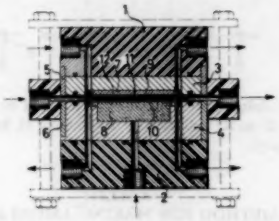


1. A finger type electrolytic cell for the electrolysis of an aqueous alkali metal chloride solution which cell comprises a plurality of anodes mounted at the bottom plate of the cell, a cathode box providing a cathode between adjacent anodes, cation exchange membranes positioned between adjacent anodes and cathodes by which the cell is partitioned into anode compartments and cathode compartments, and a cell top cover whose inside surface portion is laminated by thin multilayer sheets of a fibre reinforced plastic and is made of a chlorine-resistant material containing no polymetallic ions.

4,443,316
ELECTROLYSIS CELL WITH INTERMEDIATE CHAMBER FOR ELECTROLYTE FLOW

Bernd D. Struck, Langerwehe, Fed. Rep. of Germany, assignor to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,457
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041799; Nov. 6, 1980, 3041823
Int. Cl.³ C25B 9/00, 13/02, 13/08
U.S. Cl. 204—263 7 Claims



1. An electrolysis cell for the production of hydrogen and sulfuric acid from water and sulfur dioxide having an anode chamber, an intermediate chamber and a cathode chamber and means for causing an electrolyte to flow through said intermediate chamber as well as means for supplying electrolytes respectively to said anode and cathode chambers, said intermediate chamber being bounded on opposite sides by separators constituted of cation-exchanger membranes separating said intermediate chamber respectively from said anode and cathode chambers, said cell further comprising a permeably porous and stiff structure or body (12) of graphite extending across said intermediate chamber for supporting said separators against pressure tending to push them towards each other.

4,443,317
ELECTRODE FOR ELECTROLYSIS AND PROCESS FOR ITS PRODUCTION

Yukio Kawashima; Makoto Kobayashi, and Mayu Murakami, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

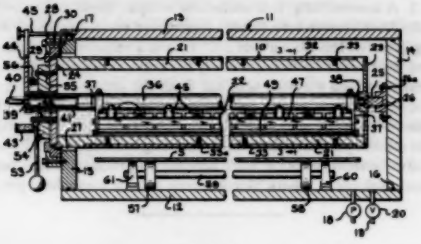
Filed Oct. 8, 1982, Ser. No. 433,390
Claims priority, application Japan, Oct. 8, 1981, 56-160453
Int. Cl.³ C25B 11/00; C25C 7/02
U.S. Cl. 204—290 F 12 Claims

1. An electrode for electrolysis having a coating which consists essentially of 40 to 90 mole % of palladium oxide, 0.1 to 20 mole % of platinum, and 5 to 50 mole % of $(Ru_xTi_{1-x})O_2$, wherein x ranges from 0.05 to 0.5, based on the total molar composition.

4,443,318
CATHODIC SPUTTERING APPARATUS

Harold E. McKelvey, Plymouth, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Aug. 17, 1983, Ser. No. 523,928
Int. Cl.³ C23C 15/00
U.S. Cl. 204—298 15 Claims

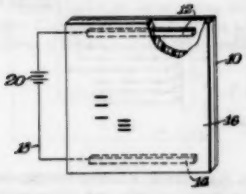


1. A rotatable sputtering cathode, comprising an elongated cylindrical tubular member, means for rotating said tubular member, and target means provided with coating material to be sputtered removably secured to said tubular member.

4,443,319
DEVICE FOR ELECTROPHORESIS

Edward M. Chait; Mary L. Gianelli, and Donald R. Johnson, all of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,836
Int. Cl.³ G01N 27/26, 27/28
U.S. Cl. 204—299 R 7 Claims



1. An improved electrophoresis device having a thin film support substrate, a separating gel formed on one face of the substrate, and means for applying an electric potential across at least a portion of the gel characterized by the applying means including spaced electrodes on the substrate integrated into and in electrically conductive contact with the gel, thereby to reduce the bulk of the device.

4,443,320
LIQUID TREATER HAVING ELECTRICAL CHARGE INJECTION MEANS

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Continuation of Ser. No. 229,960, Jan. 30, 1981, Pat. No. 4,341,617. This application Jul. 27, 1982, Ser. No. 402,269
Int. Cl.³ B03C 5/02
U.S. Cl. 204—302 3 Claims

1. An electrical treater for use in causing the flocculation of impurity particles in a liquid comprising:

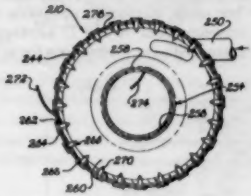
an outer cylindrical electrode for defining a treating chamber;

means for introducing liquid to be treated into said chamber and for directing liquid out of said chamber after treatment;

an inner cylindrical electrode coaxially housed within said outer electrode in radially spaced relation thereto; and

means for connecting said electrodes across a source of electrical potential for oppositely charging the same and for exposing the liquid in said chamber to an electric field established between said electrodes,

at least one of said electrodes including a multiplicity of projections each directed toward the other electrode and terminating in an outermost, generally conical tip, said one electrode being provided with an electrical insulator



substantially covering all but said conical tips of the projections whereby substantially only said conical tips are exposed to said liquid in the chamber,

said uninsulated conical tips having axes which extend radially from the one electrode toward the other whereby to render said electric field non-uniform and having lines of force converging to said tips.

4,443,321
SUPERCRITICAL SOLVENT COAL EXTRACTION

Leslie E. Compton, Claremont, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 17, 1981, Ser. No. 322,312
Int. Cl.³ C10G 1/00, 1/06
U.S. Cl. 208—8 LE 13 Claims

1. A method of separating an organic extract from an inorganics-containing coal comprising the steps of:

adding to a closed reactor particulate coal and a mixture of solvents consisting of a first and second solvent absent straight chain polynuclear compounds and hydrogen donor solvents; said first solvent being present in the mixture in an amount above 1% and below 50% by weight and consisting of at least one low volatility, bent ring, polycyclic, aromatic organic compound containing at least three rings, having a high critical temperature above 450° C. and being capable of at least 20% by weight catalytic dissolution of the coal into the soluble extract fragments and the second solvent consisting of a higher volatility organic or inorganic compound which is stable at the operating temperature and having a critical temperature below 300° C.;

heating the reactor to a temperature above 250° C. and below 450° C. and within 200° C. above or below the critical temperature of the solvent mixture at a pressure from 500 to 5,000 psig to form a dense gas phase;

extracting organic coal components into the dense gas phase; and

removing said phase from the reactor.

4,443,322
CONTINUOUS PROCESS AND APPARATUS FOR SEPARATING HYDROCARBONS FROM EARTH PARTICLES AND SAND

Duncan B. Jubenville, Windsor, Canada, assignor to TekSonix, Inc., Commerce City, Colo.

Division of Ser. No. 213,956, Dec. 8, 1980, Pat. No. 4,358,373. This application Aug. 18, 1982, Ser. No. 409,168
Int. Cl.³ C10G 1/04
U.S. Cl. 208—11 LE 11 Claims

1. A continuous process for the separation of hydrocarbons

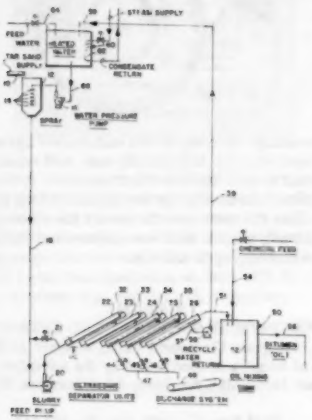
from earth and sand particles containing said hydrocarbons comprising:

(A) breaking said particles into a size less than about two centimeters in diameter,

(B) suspending said broken particles in water,

(C) pumping the suspension of broken particles upwardly through an inclined duct from its lower end,

(D) subjecting the suspension of particles in and along said duct to horizontal ultrasonic vibrations ranging in frequency between about 18 and 27 kiloHertz so that each particle is exposed to said vibrations for at least about five



minutes to separate substantially all of said hydrocarbons from said earth and sand particles and to entrain the densest of said hydrocarbons with gases from cavitation sufficient to cause said densest hydrocarbons to float on said water to the upper end of said duct,

(E) removing said separated earth and sand particles continuously along the lower side of said inclined duct,

(F) removing said separated hydrocarbons from the floating layer formed thereof at the upper end of said duct, and

(G) recycling said water from below said layer at the upper end of said duct to the broken particles pumped into the bottom of said duct.

4,443,323

PROCESS FOR THE OIL EXTRACTION FROM OIL SAND BY USING CYCLODEXTRIN AND HYDROCARBON SOLVENTS

Koki Horikoshi, Tokyo, Japan; Ichiro Shibanai, No. 6-10-6-312, Akasaka, Minato-ku, Tokyo, Japan, and Takashi Kato, Higashiyamato, Japan, assignors to Rikagaku Kenkyusho and Ichiro Shibanai, both of Wako, Japan

Filed Aug. 16, 1983, Ser. No. 523,688

Claims priority, application Japan, Aug. 20, 1982, 57-144385

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—11 LE **24 Claims**

1. A process for the oil extraction from oil sand, which comprises mixing oil sand, cyclodextrin, a hydrocarbon solvent, a flocculating agent and water with one another to prepare a suspension, leaving the suspension to stand or centrifuging it to separate into an oil, a water and a sand layer, and then collecting the oil layer.

4,443,324

LOW MELTING MESOPHASE PITCHES

Russell J. Diefendorf, Clifton Park, and Shih-Heui Chen, Troy, both of N.Y., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 14, 1982, Ser. No. 388,479

Int. Cl.³ C10C *1/18, 3/08, 3/00*

U.S. Cl. 208—22 **7 Claims**

1. A low melting, low molecular weight, heptane insoluble, 1,2,4-trichlorobenzene soluble mesophase pitch having a melting point of less than about 250° C. and a molecular weight of less than about 1000 prepared by the method which comprises heating a feed material selected from the group consisting of chrysene, triphenylene, and para-terphenyl, dissolving the heated material with 1,2,4-trichlorobenzene and recovering the soluble portion therefrom contacting the resulting 1,2,4-trichlorobenzene solution with heptane to precipitate said heptane insoluble, 1,2,4-trichlorobenzene soluble mesophase pitch.

4,443,325

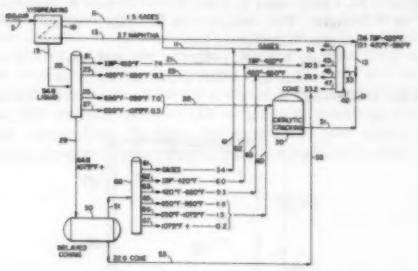
CONVERSION OF RESIDUA TO PREMIUM PRODUCTS VIA THERMAL TREATMENT AND COKING

Nai Y. Chen, Titusville, and Lillian A. Rankel, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1982, Ser. No. 452,482

Int. Cl.³ C10B *55/10*; C10G *65/18*

U.S. Cl. 208—55 **10 Claims**



1. A process for treating a heavy hydrocarbon feedstock, comprising asphaltenes, metals, and sulfur, said process consisting essentially of the following steps

A. thermally treating said feedstock in the absence of an added catalyst at a temperature below thermal cracking temperatures and above about 750° F., a space velocity of no more than about 1.5, and at a pressure greater than about 400 psig to produce gas, naphtha, and a liquid without formation of a sludge, a coke, or a coke deposit;

B. fractionating said liquid to produce fractions boiling below about 650° F., between about 650° and about 1075° F., and above about 1075° F.;

C. delay coking said fraction boiling above 1075° F. to produce liquid products and coke;

D. fractionating the liquid products of said coking to produce fractions boiling below about 650° F. and above about 650° F.;

E. combining said fraction boiling between about 650° and about 1075° F. from said fractionating of Step B with said fraction boiling above about 650° F. from said fractionating of Step D and catalytically cracking said combined fractions in a fluid catalytic cracking process to produce gases and a liquid product; and Z

F. fractionating said naphtha of Step A and said gases and said liquid product of Step E to produce gases and products boiling between the initial boiling point and about 650° F.

4,443,326

TWO-STEP REFORMING PROCESS

Leslie A. Field, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 311,834, Oct. 16, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,406
Int. Cl.³ C10G 35/04
U.S. Cl. 208—64 24 Claims

1. A hydrocarbon conversion process comprising:

(a) contacting a hydrocarbon feed with a dehydrocyclization catalyst at dehydrocyclization conditions to form a reformate, wherein at least part of said dehydrocyclization catalyst comprises a large-pore zeolite containing at least one Group VIII metal; and

(b) contacting said reformate with an intermediate pore size zeolite at a temperature of from 800° F. to 1100° F., an LHSV of from 0.1 to 10, and an H_2/HC of from 0 to 6.

4,443,327

METHOD FOR REDUCING CATALYST AGING IN THE PRODUCTION OF CATALYTICALLY HYDRODEWAXED PRODUCTS

David S. Shihabi, Pennington, and John D. Lutner, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,218
Int. Cl.³ C10G 47/20, 65/12
U.S. Cl. 208—97 17 Claims

1. A method for reducing the aging rate of a highly siliceous zeolite catalyst used in the catalytic hydrodewaxing of 399° C.+ (750° F.+) hydrocarbon feedstock, which method comprises the addition of from about 0.1 to 10 weight percent olefins to said feedstock prior to its exposure to said catalyst under hydrocarbon hydrodewaxing conditions which include a hydrogen pressure of between about 50 to 400 psig.

4,443,328

METHOD FOR CONTINUOUS THERMAL CRACKING OF HEAVY PETROLEUM OIL

Masao Sakurai, Mitaka, and Tetsuo Wada, Ohmuta, both of Japan, assignors to Toyo Engineering Corporation and Mitsui Coke Co., Ltd., both of, Japan

Filed Jun. 1, 1982, Ser. No. 384,000
Int. Cl.³ C10G 9/16, 9/00
U.S. Cl. 208—106 7 Claims

1. In a method for the continuous thermal cracking of heavy petroleum oil, the iprovement which comprises the steps of:

(a) continuously charging a pre-heated petroleum oil feed into the upper reaction zone of an upright cylindrical reactor, said reactor having upper and lower reaction zones separated from each other by foraminous partition plate, said lower zone having at least one section;

(b) subjecting said feed to a thermal cracking reaction at cracking temperatures and pressures;

(c) removing cracked gas and oil vapors from said upper reaction zone;

(d) simultaneously passing the resultant reaction liquid from said upper reaction zone to and through said lower reaction zone without back-mixing;

(e) passing any additional cracked gas and oil vapor formed in said lower reaction zone upwardly through the reactor and removing them from said upper reaction zone; and

(f) discharging residual pitch formed in said lower reaction zone from the bottom of said lower reaction zone.

4,443,329

CRYSTALLINE SILICA ZEOLITE-CONTAINING CATALYST AND HYDROCARBON HYDROPROCESSES UTILIZING THE SAME

Paul E. Eberly, Jr., and William E. Winter, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Division of Ser. No. 281,860, Jul. 9, 1981. This application Nov. 12, 1982, Ser. No. 440,868
Int. Cl.³ C10G 47/12
U.S. Cl. 208—111 18 Claims

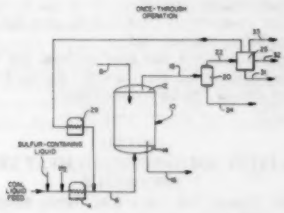
1. A hydroprocessing process which comprise contacting a hydrocarbonaceous feed at hydrocarbon hydroprocessing conditions with a catalyst comprising an effective amount of a crystalline silica zeolite having uniform pore diameters, a hydrogenation component and a non-zeolitic inorganic oxide support, said hydrogenation component being associated with said support.

4,443,330

CATALYST ACTIVITY IN COAL LIQUID UPGRADING

Govanon Nongbri, Newton, Pa., assignor to HRI, Inc., Lawrenceville, N.J.

Filed Jun. 1, 1981, Ser. No. 269,113
Int. Cl.³ C10G 47/12
U.S. Cl. 208—112 12 Claims



1. In a process of upgrading of coal liquid where the coal liquid is fed with hydrogen into a catalytic reactor wherein the catalyst is an alumina based catalyst of a Group VI, VII or VIII metal oxide, the improvement comprises feeding a sulfur-containing liquid having a boiling point range from about 250° F. to about 700° F. with the coal liquid being fed at a space velocity ranging from about 0.2 to about 1.5 cuft/hr/cuft of reactor volume and under a pressure ranging from about 1500 to about 3000 psig hydrogen partial pressure, said sulfur-containing liquid being fed in an amount of between about 0.2 and about 2.0 weight percent of said coal liquid feed.

4,443,331

PROCESS AND DEVICE FOR SEPARATING PARTICLES IN A FLUID ESPECIALLY FOR THE CLEANING OF THE SUSPENSIONS HANDLED IN THE PAPER INDUSTRY

Francois Julien Saint Amand, Grenoble, France, assignor to Centre Technique de l'Industries des Papiers Carton et Celluloses, Grenoble, France

Filed Mar. 20, 1981, Ser. No. 245,938
Claims priority, application France, Mar. 21, 1980, 80 07244
Int. Cl.³ B04B 1/08
U.S. Cl. 209—211 13 Claims

1. A process for selectively separating particles from a suspension which comprises:

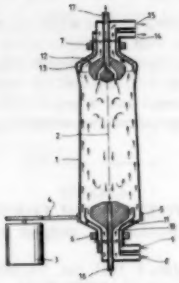
rotating a separation chamber about a longitudinal axis such that when a fluid is inside the separation chamber it forms a free vortex in said chamber;

introducing a suspension into the separation chamber in a slightly oblique direction with respect to the longitudinal axis of the chamber and causing the suspension to flow

with an angular velocity slightly larger than the angular velocity of the wall;

controlling the flow of the suspension in the chamber, in order to maintain this excess of angular velocity so that the free vortex is comprised of multiple concentric layers having convergent conical shapes;

collecting the major part of the treated suspension from a zone near the periphery of the vortex and deviating the suspension towards the longitudinal axis; and



separately removing:

the heavy components from a zone near the sidewalls of the separation chamber;

the light components from a zone near the longitudinal axis of the chamber; and

an intermediate fraction from at least one intermediate zone between the removal zones for the heavy components and for the light components.

4,443,332

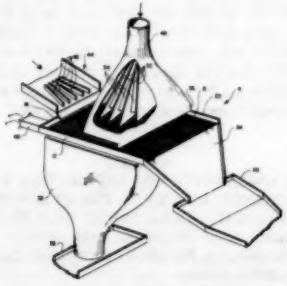
CROSS FLOW SOLID-TO-SOLID HEAT TRANSFER APPARATUS

Noel H. de Nevers, Salt Lake City, Utah, assignor to Oros Company, Salt Lake City, Utah

Division of Ser. No. 167,794, Jul. 14, 1980. This application Jul. 22, 1982, Ser. No. 400,913

Int. Cl.³ B07B *1/36*

U.S. Cl. 209—331 **4 Claims**



1. Crossflow heat exchange apparatus comprising:

a generally planar separator means formed with a plurality of apertures therein and oriented generally at an acute angle with the horizontal;

first means for introducing onto said separator means a first granular material whose particles being of a certain temperature are generally of a size too large to pass through said apertures, said first means including means for spreading said first material uniformly over the upper side of the separator means;

second means for introducing onto and distributing and spreading over the first material on the separator means a second granular material whose particles being of a temperature different from said certain temperature are generally of a size small enough to enable passage thereof through said apertures, wherein said second introducing means comprises a chute, a lower end of which is positioned over the separator means, and a rear side of which forms a barrier means which extends generally crosswise of the slope of the separator means to inhibit movement of the second material along the downward slope of the separator means; and

vibrator means coupled to said separator means for agitating the separator means so that the first material is caused to move toward the lower side of the separator means and the second material is caused to sift through the first material and through the apertures, the first and second granular materials thereby contacting one another to allow transfer of heat therebetween.

4,443,333

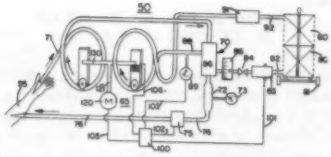
PORTABLE DIALYSIS SYSTEM AND PUMP THEREFOR

Sakharam D. Mahurkar, 1926 W. Harrison St., Chicago, Ill. 60612

Filed Sep. 24, 1981, Ser. No. 305,202

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—87 **10 Claims**



6. A lightweight and portable system for dialysing blood wherein blood passes through an exchange station with the blood contacting one side of a semipermeable membrane and dialysate contacting the other side of the semipermeable membrane, said system comprising elastic tube means adapted to be connected to a blood source and to return blood thereto for conducting blood past a plurality of stations, a blood clot detector and an air bubble detector in communication with said blood tube means, elastic tube means adapted to be connected to a source of dialysate for conducting dialysate past a plurality of stations, means for measuring and regulating dialysate flow, pressure, temperature and conductivity, means for maintaining the dialysate at a lower pressure than the blood during passage through the exchange station, a single motor means having the output shaft thereof connected to at least two peristaltic pumps one for transporting blood in said elastic blood tube means and the other for transporting dialysate in said elastic dialysate tube means, mechanism associated with said motor means and said peristaltic pumps for maintaining the dialysate flow at about three times the blood flow, each of said peristaltic pumps having an inner arcuate bearing surface, said blood pump having at least two rollers associated with said inner arcuate bearing surface to trap said blood tube means therebetween, said dialysate pump having a single roller associated with said inner arcuate bearing surface to trap said dialysate tube means therebetween, actuation of said peristaltic blood pump causing smooth laminar flow of blood in said blood tube means due to said rollers, actuation of said peristaltic dialysate pump causing dialysate flow due to a vacuum generated by said single roller resulting in the deformation and return of said elastic dialysate tube means, and control mechanism operatively connected to the blood clot detector and the air bubble detector and to said motor means and to the dialysate flow, pressure, temperature and conductivity measuring means for selectively stopping the dialysate roller thereby halting movement of dialysate through

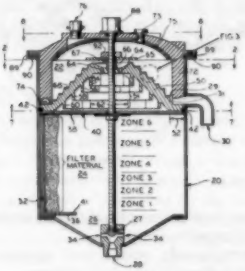
the dialysate tube means and through the exchange station in response to pressure or temperature or conductivity measurements outside of a preselected range while maintaining blood flow and for simultaneously stopping all the rollers in response to a signal from either the blood leak detector or the air bubble detector to shut down the entire system and halt pumping.

4,443,334

OIL RECLAMATION DEVICE

Lynn E. Shugarman, Costa Mesa; Alvin E. Shugarman, Santa Ana, both of Calif., and Michael G. Rothman, Chicago, Ill., assignors to Recon Ltd., Northbrook, Ill.

Filed Sep. 15, 1980, Ser. No. 186,838
Int. Cl.³ B01D *35/18, 3/28*
U.S. Cl. 210—168 **43 Claims**



1. A contaminated fluid-reclaiming device comprising a filter housing having an inlet distributed uniformly over the bottom of the housing for intake of contaminated fluid and an upper vaporization chamber having a clean fluid outlet at a location which is displaced downwardly from the top of the chamber and near the bottom of said vaporization chamber, an output of said filter housing communicating with and becoming an input of the vaporization chamber, filter material means positioned in said filter housing and spread uniformly over said distributed inlet for removing solid contaminants from fluid passing between the inlet and outlet, vaporization plate means enclosed within said chamber wherein the bottom of said vaporization plate has at least one dependent heat exchange and turbulence-causing means for increasing the temperature and uniformity of heat dispersion within said fluid when applied to said input, and means on the upper surface of said vaporization plate for providing at least one thin film ribbon of fluid flowing down said vaporization plate to said outlet, said thin film ribbon of fluid being conveyed by a channel means for continuously guiding and directing said ribbon downwardly along the upper surface of said vaporization plate for vaporization of fluid contaminants.

4,443,335

AERATION DEVICE

Michael Gullace, 3805 Dogwood St., NW., Uniontown, Ohio 44685

Filed Jun. 18, 1982, Ser. No. 389,769
Int. Cl.³ C02F *7/00*
U.S. Cl. 210—220 **1 Claim**

1. An aeration device for use in introducing air into a pool of water, said device comprising:

means for securing said device to a conventional water introduction threaded spout, protruding through a wall of an enclosure containing said pool of water;

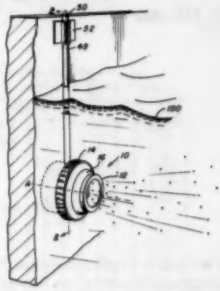
said means for securing said device including a threaded retaining ring;

said threaded retaining ring secures a spherical portion of said aeration device and said threaded spout;

water-directing means including a conduit for directing water from said spout through said spherical portion into said pool;

means within said conduit for creating a suction within said conduit as water passes as a flow stream into the pool;

means for responding to said suction by permitting the introduction of ambient air into said flow stream, thus, aerating the water entering the pool;



said means for responding comprises a channel creating fluid communication between said flow stream and the exterior of the device, and air means for connecting said channel to a source of ambient air; and

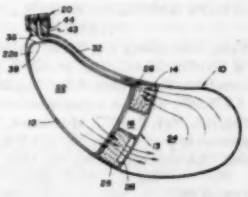
said air means is a tube having one end connected to said channel and the other end positioned above the water level of said pool, said tube secured to said wall of said enclosure on the same side of said wall through which said spout protrudes and connects with said aeration device.

4,443,336

SURVIVAL AND WATER PURIFICATION SYSTEM

Mary L. Bennethum, 6790 Castle Dr., Birmingham, Mich. 48010

Filed Oct. 4, 1982, Ser. No. 432,682
Int. Cl.³ B01D *27/02*
U.S. Cl. 210—238 **10 Claims**



1. A portable filter unit, comprising;

an outer flexible container including a top;

an upper compartment of flexible material enclosed in said container;

a lower compartment of flexible material enclosed in said container;

a tube communicating between said lower compartment and the upper end of said container and including an upper end and a lower end;

a rigid filter means mounted in said container intermediate said compartment; and

a filter means including a pair of separate filter units, one communicating between said upper and lower compartments and the other between the lower compartment and the lower end of said tube, respectively.

4,443,337

BIOLOGICAL TREATMENT OF WASTE WATER

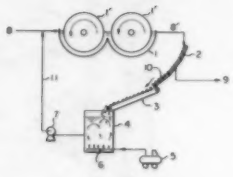
Mitsunobu Otani; Teruo Senda, and Michio Hirose, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 114,410, Jan. 22, 1980, abandoned, and a continuation of Ser. No. 943,769, Sep. 20, 1978. This application Feb. 25, 1982, Ser. No. 352,203

Claims priority, application Japan, Mar. 31, 1978, 53-36719

Int. Cl.³ C02F *3/05*

U.S. Cl. 210—602 **22 Claims**



1. A method for biologically purifying waste water containing biodegradable substances comprising the steps of:

a. contacting the waste water with microorganisms in a biological fixed film type reactor under conditions sufficient to degrade the biodegradable substances and to produce a sludge which contains a mixture of bacteria, protozoa, and large organisms;

b. separating and concentrating the sludge from the biologically treated waste water discharged from the reactor of step (a) in the presence of sufficient oxygen to maintain life in the protozoa and large organisms of the sludge by using a static inclined screen separator;

c. aerobically digesting the sludge discharged from the separator of step (b) in the presence of sufficient oxygen to maintain life in the protozoa and large organisms of the sludge by using a digester; and

d. returning substantially all of the digested sludge containing live protozoa and live organisms to the reactor of step (a) or to a line upstream thereof, whereby substantially all of the sludge is recycled.

4,443,338

CONVERSION OF PLUG FLOW AND COMPLETE MIX AERATION BASINS TO BARRIER OXIDATION DITCHES

John H. Reid, 7 Stansbury Ct., Fredericksburg, Va. 22401

Division of Ser. No. 75,412, Sep. 14, 1979, Pat. No. 4,394,268, which is a continuation-in-part of Ser. No. 28,383, Apr. 9, 1979, Pat. No. 4,278,547, which is a continuation-in-part of Ser. No. 848,705, Nov. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 649,995, Jan. 19, 1976, abandoned. This application Sep. 30, 1982, Ser. No. 429,165

Int. Cl.³ C02F *3/20*

U.S. Cl. 210—629 **8 Claims**

1. A method for converting a reactor basin on an activated sludge process from a plug-flow or complete mix configuration to an oxidation-ditch configuration, said method comprising:

A. forming an endless channel within said basin, said endless channel having parallel sides and a floor and being annular in shape;

B. placing a barriered circulator/aerator within said endless channel, said circulator/aerator comprising:

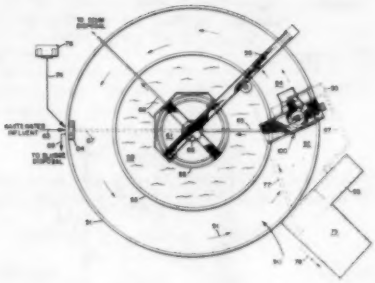
1. a barrier means for: (a) separating mixed liquor, within said channel and in the vicinity of said circulator/aerator, into upstream liquor within an intake channel and downstream liquor within a discharge channel, and (b) providing hydraulic support to said downstream liquor,

2. a flow passage which connects said upstream liquor to said downstream liquor,

3. a pump means for propelling up to all of said upstream liquor through said flow passage from said intake channel to said discharge channel, and

4. an aeration means for dispersing an oxygen-containing gas into said upstream liquor to form freshly aerated mixed liquor, said aeration means being disposed to contact said upstream liquor after the upstream liquor has entered said flow passage and before the upstream liquor has become said downstream liquor, and

C. selectively and independently operating said pump means and said aeration means in order to:



1. prevent backmixing of said freshly aerated mixed liquor to said aeration means;

2. homogeneously aerate said upstream liquor being pumped through said flow passage;

3. selectively adjust the lengths of an aerobic zone and an anoxic zone which are formed in said endless channel, downstream of said barrier means; and

4. translationally propel said freshly aerated mixed liquor through said aerobic zone and through said anoxic zone for a selected distance, wherein said endless channel is annular in shape.

4,443,339

COMPOSITE MATERIALS

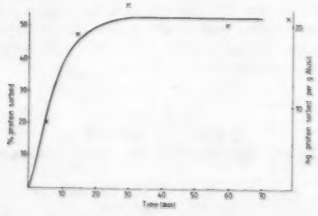
Alan Rosevear, Uffington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Sep. 3, 1981, Ser. No. 299,294

Claims priority, application United Kingdom, Sep. 11, 1980, 8029342

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—635 **13 Claims**



1. A method for the selective retention of chemical species from a fluid substance containing said chemical species which comprises contacting a fluid containing chemical species to be selectively retained with an unscored composite material for the selective retention of chemical species from a fluid under conditions whereby the chemical species is selectively removed and retained by the composite material, said unscored composite material being prepared by a method comprising applying a gel precursor to a porous support material in sheet form, said gel precursor containing insoluble particles of active

material capable of selectively retaining the chemical species, and gelling the gel precursor to form an unscored composite material comprising the support material, a permeable gel retained on both sides of the support material so that the latter is encased by and enmeshed by, permeable gel having said active material retained and distributed therein.

4,443,340
CONTROL OF IRON INDUCED FOULING IN WATER SYSTEMS

Roger C. May, Glenside, and Frank C. Sessa, Wyncote, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 310,163, Oct. 9, 1981, Pat. No. 4,387,027. This application May 24, 1983, Ser. No. 497,612
The portion of the term of this patent subsequent to Jun. 7, 2000, has been disclaimed.
Int. Cl.³ C02F *5/12*
U.S. Cl. 210—697 **25 Claims**

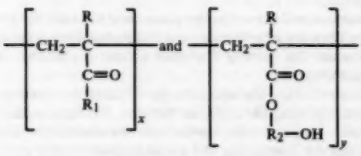
1. A method of inhibiting corrosion and controlling deposition in an aqueous medium contained in a cooling water system of the type comprising iron species present in said medium in a deposit forming amount and under deposit forming conditions, said method being capable of providing for the formation of a protective passive oxide film on metallic surfaces in contact with said aqueous medium, said medium being further characterized by the absence of an organo-phosphonic acid compound therein, wherein said method consists essentially of:

(i) assuring that the pH of said aqueous medium is 5.5 or above;

(ii) assuring that the aqueous medium contains a calcium or other appropriate ion concentration selected from the group consisting of zinc, nickel and chromium and mixtures thereof; and

(iii) adding to said aqueous medium

(a) a water-soluble polymer comprising moieties derived from an acrylic acid or water-soluble salt thereof and moieties of an hydroxylated lower alkyl acrylate, wherein the moieties of the polymer have the following formulas:



wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, OM or NH_2 where M is a water-soluble cation; R_2 is a lower alkyl of from about 2 to 6 carbon atoms and the mole ratio of x:y is 34:1 to 1:4;

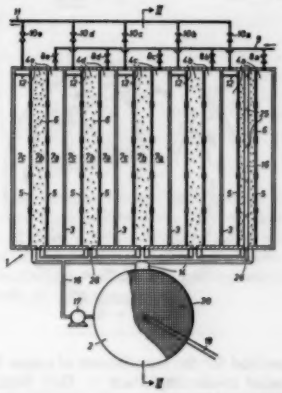
(b) a water-soluble orthophosphate compound; said polymer, together with the orthophosphate compound, being effective to promote the formation of said metal oxide film with no attendant deposition of said iron, and the amount of (a) and (b) being added being sufficient to provide a substantially scale-free protective passive oxide film on the metallic surface, and

(c) from about 0.4 to 450 parts per million parts of said aqueous medium of a topping agent selected from the group consisting of effective water soluble aminocarboxylic acids, lignosulfonates, citric acid, and tannic acid, and water soluble salt forms and mixtures thereof.

4,443,341
PROCESS AND APPARATUS FOR REMOVAL OF SOLIDS FROM LIQUIDS

Michael A. Miller, New Fairfield, Conn., and Richard P. Johansen, Chappaqua, N.Y., assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,976
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107639
Int. Cl.³ B01D *23/10*
U.S. Cl. 210—702 **29 Claims**



1. In a process for the removal of solids from liquids comprising passing a solids-containing liquid horizontally through a filter bed vertically disposed in a chamber, and wherein the filter bed is regenerated after absorption of the solids, the improvement comprising the sequential steps of dividing the liquid stream into at least two partial streams, conducting each partial stream through a respective filter bed arranged in a chamber, with each filter bed comprising discontinuous flexible polyurethane particles, interrupting the liquid feed to and the liquid discharge from the respective chamber after the polyurethane particles have been substantially completely loaded with the solids, regenerating the polyurethane particles by at least one of agitating and gas treating said polyurethane particles to cause the solids adhering thereto to be transferred into the remaining liquid volume of the chamber, and discharging the remaining liquid volume together with the solids, whereby said polyurethane particles are regenerated.

4,443,342
TREATMENT OF WASTE WATER CONTAINING ORGANIC SULPHUR COMPOUNDS

Georges Stas, Ottignies, Belgium, and Christian Biver, L-Hagen, Luxembourg, assignors to INTEROX (Societe Anonyme), Brussels, Belgium

Filed Mar. 31, 1982, Ser. No. 363,950
Claims priority, application France, Mar. 31, 1981, 81 06589
Int. Cl.³ C02F *1/72*
U.S. Cl. 210—759 **6 Claims**

1. Process for the treatment of waste water containing dialkyl disulphides, by catalytic oxidation of these compounds by means of a peroxide compound, in an aqueous medium, wherein divalent copper ions are used as the catalyst, the medium is kept at a pH of 2.5 to below 6.5, from 0.001 to 1 gram of copper ions is used per liter of medium, and the peroxide compound is used in an amount such that the ratio of the amount of peroxide compound, expressed in mol equivalents of 100% strength H_2O_2, to the amount dialkyl disulphides, expressed in mol equivalents of H_2S, is 0.5 to 10.

4,443,343

METHOD AND APPARATUS FOR MANUFACTURING PLANAR FIBER WEBS FROM SHORT, ORIENTED REINFORCEMENT FIBERS OR FIBER BLENDS

Herbert Merz, Munich, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Munich GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 402,905

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1981, 3131643

Int. Cl.³ B01D *33/02*

U.S. Cl. 210—768 **15 Claims**

1. In a method for the manufacture of planar fiber webs of short, oriented reinforcing fibers or fiber blends, including converting the reinforcing fibers or fiber blends into a slurry through the addition of a slurry liquid,; passing the slurry through an orientation section, filtering off the liquid; depositing the fibers in an oriented condition on a filter surface; the improvement comprising conveying the slurry fibers or fiber blends at a central location to the inlets of essentially laminar-flow, hydrodynamic orientation sections arranged in a star-shaped configuration and rotating about a central axis, said orientation sections each comprising a substantially radially oriented inlet and a substantially tangentially oriented outlet, and wherein said filter surface which at least partially encompasses the orientation section rotates concentrically with the orientation section at a slightly different rotational speed.

4,443,344

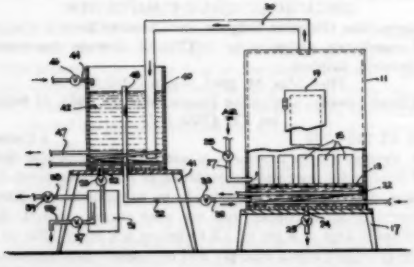
METHOD FOR RECOVERING SOLVENT

John O. Lewis, 732 The Strand, Hermosa Beach, Calif. 90254

Continuation-in-part of Ser. No. 276,950, Jun. 24, 1981, abandoned. This application Apr. 19, 1983, Ser. No. 486,348

Int. Cl.³ B01D *27/12*

U.S. Cl. 210—774 **12 Claims**



1. A method for recovering a solvent which has a weight different from that of water from a filter cartridge containing said solvent laden with foreign matter comprising the steps of

placing said cartridge in a first tank having a heating device therein,

at least partially filling a second tank with water,

feeding water from said second tank to said first tank to the area of said heating device but so as not to immerse said cartridge,

raising the temperature of said heating device sufficiently to cause at least a portion of the water in the first tank to be converted to vapor, the cartridge being saturated with vapor such that the vapor mixes with the solvent to form a water-solvent vapor mixture,

feeding the water-solvent vapor mixture from said first tank to said second tank,

condensing the water-solvent vapor mixture in said second tank to water and solvent in liquid form, the heavier of the liquids gravitating to the bottom of the second tank and thus being separated from the lighter liquid, and

removing the solvent from the second tank.

4,443,345

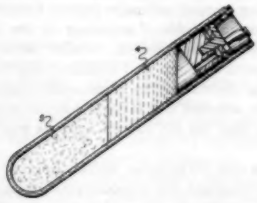
SERUM PREPARATOR

John R. Wells, 4372 Keystone Ave., Culver City, Calif. 90230

Filed Jun. 28, 1982, Ser. No. 393,037

Int. Cl.³ B01D *21/26*

U.S. Cl. 210—782 **16 Claims**



15. A method for separating serum from blood, for filtering the separated serum, and for partitioning the serum filtrate from unfiltered blood, the method using a tube for containing the blood and a serum preparator for filtering and partitioning the blood, the serum preparator having a density approximately isopycnic with blood and having,

a piston adapted to insert into the tube and to sediment within the tube and defining an aperture for the passage of serum,

an annular seal betweem the piston and the tube for preventing blow-by of serum around the piston during sedimentation and for forcing displaced serum to pass through the aperture,

a filter covering the aperture for filtering particulates from serum passing through the aperture, the filter sealed to the piston for preventing serum blow-by around the filter, and

a means for restraining the sedimentation of the piston, the restraining means attached to the piston, and including a detent attached to the piston and contacting the tube for positioning and holding the piston above the serum in the tube above the blood and for releasing the piston for travel down the bore of the tube,

the piston, annular seal, and filter acting in combination to obstruct the passage of particulates across the serum preparator,

the method comprising steps for,

inserting the serum preparator into the tube containing the blood, for

loading the assembled tube and serum preparator into a centrifuge rotor, for

first spinning the loaded assembly in the rotor at a first speed sufficient to separate the serum and cellular components of blood and less than sufficient to overpower the restraining means so as to restrain the sedimentation of the serum preparator and to enable the cellular components of blood

to sediment sooner to the cellular pellet than the serum preparator, and for

second spinning the loaded assembly in the rotor at a second speed sufficient to overcome the restraining means so as to enable the serum preparator to sediment within the tube and to cause displaced serum to pass through the aperture and across the filter, thereby filtering the separated serum,

said second spinning continued until the serum preparator has reached a stop position and established a partition thereat,

said inserting of the serum preparator into the tube establishing a contact between the restraining means and the tube, thereby causing the serum preparator to be held at a catch position within the tube,

said second spinning continuing until the sedimentation of the serum preparator effectively reaches the stop position at isopycnic equilibrium near the interface between the separated serum and the cellular pellet and establishes a partition thereat for preventing contamination of the serum filtrate by the cellular pellet during storage and decanting.

4,443,346

METHOD OF CLEANING FILTER ELEMENTS

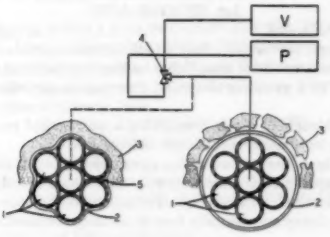
Hans Müller, Erlenbac, Switzerland, assignor to DrM, Dr. Mueller, AG, Maennedorf, Switzerland

Filed Aug. 30, 1982, Ser. No. 412,857

Claims priority, application Switzerland, Sep. 2, 1981, 5637/81

Int. Cl.³ B01D *29/38*

U.S. Cl. 210—785 **2 Claims**



1. A method of cleaning alluvial filters of the type including candle-like filter elements having a filter cloth on which a filter cake is formed during filtration and a filtration conduit through which a cleaning fluid is supplied to said filter elements, the method comprising applying pressure and vacuum in the alternating fashion to said filtration conduit after a filtration process has been completed whereby pressure fluctuations are generated under frequencies increasing up to vibrations which cause an alternating expansion of the filter cloth of the filter elements and the filter cake is separated from the filter cloth.

4,443,347

PROPPANT CHARGE AND METHOD

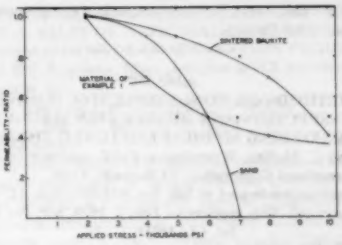
David R. Underdown, Alvin, and O. Howard Glaze, Kingwood, both of Tex., assignors to Baker Oil Tools, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 327,002, Dec. 3, 1981. This application May 13, 1983, Ser. No. 494,548

Int. Cl.³ C09K *3/00*; E21B *43/267*

U.S. Cl. 252—8.55 R **1 Claim**

1. A method for propping a fracture in a subterranean formation which comprises injecting into a subterranean well a suspension in a carrier fluid of a pre-cured proppant charge, said pre-cured proppant charge being pre-cured prior to injection into the subterranean well, said pre-cured proppant charge comprising, prior to injection of the pre-cured proppant charge into said well, resin coated sand particles most of which are composed of a single substrate particle with a thermoset resite coating thereon, the resite coating being one which, when it is the resin coating on sand particles of a proppant charge, produces a charge wherein at least one of: (a) the Conductivity Ratio thereof, throughout a given closure stress range, is greater than that of a charge of the uncoated sand



particles having substantially the same particle size distribution; or (b) the Permeability Ratio thereof, throughout the stress range of about 2,000 to 10,000 p.s.i. is at least about 30 percent that of a sintered bauxite charge of substantially the same particle size, the resin for said coating being at least one of: (1) a resole; or (2) a novolac.

4,443,348

PROTECTIVE LUBRICANT COMPOSITION

John H. Wright, Troy, and Alfred H. Smith, Jr., Boston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jul. 13, 1982, Ser. No. 397,811

Int. Cl.³ C10M *1/20, 1/54*

U.S. Cl. 252—37.2 **16 Claims**

1. A protective lubricating composition comprising mineral seal oil, an amount of a fatty acid soap of a metal selected from the group consisting of lithium, sodium, barium, aluminum and calcium sufficient to gel said mineral seal oil, an amount of mineral spirits effective to disperse said fatty acid soap, and an amount of a metal naphthenate selected from the group consisting of naphthenates of magnesium, calcium, cobalt, cadmium, barium, lead and zinc sufficient to maintain the composition in fluid form in the presence of said fatty acid soap.

4,443,349

FLUORINATED ALIPHATIC POLYALKYLETHER LUBRICANT WITH AN ADDITIVE COMPOSED OF AN AROMATIC PHOSPHINE SUBSTITUTED WITH PERFLUOROALKYLETHER GROUPS

Carl E. Snyder, Jr., Trotwood, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 14, 1982, Ser. No. 417,931

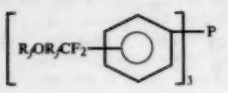
Int. Cl.³ C10M *1/30, 1/44*

U.S. Cl. 252—49.9 **10 Claims**

1. A lubricant composition comprising (1) a base fluid consisting essentially of a fluorinated polymer having the formula

$$F[CF(CF_3)CF_2O]_nCHFCF_3$$

wherein n is an integer indicating the degree of polymerization and (2) a corrosion inhibiting amount of an aromatic phosphine with perfluorinated polyalkyether substituents having the formula



wherein R_fOR_f— is a perfluoroalkylether group containing at least one ether linkage.

4,443,350

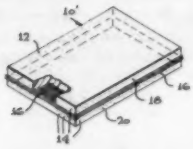
METHOD FOR NONDESTRUCTIVE MAGNETIC INSPECTION AND RUBBER-LIKE MAGNETIC RECORDING MEDIUM EMPLOYED THEREIN

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 932,893, Aug. 11, 1978, abandoned. This application Feb. 1, 1979, Ser. No. 8,316

Int. Cl.³ H01F *1/117*

U.S. Cl. 252—62.54 **16 Claims**



1. A magnetizable recording medium for magnetic inspection of an object comprising a pad of a rubber-like resilient matrix formed of a polymer having dispersed therein Fe_2O_3 magnetic oxide particles having a high magnetic remanent flux density of at least about 1,850 gauss and a high magnetic coercive force of at least about 280 oersteds, and wherein said Fe_2O_3 particles are non-migrating in said rubber-like resilient material, employing about 4 to about 50% of said magnetic oxide particles by weight of said matrix, said Fe_2O_3 magnetic oxide particles permitting obtaining multiple magnetic recordings of cracks at an angle to each other or essentially parallel to each other in the recording medium without erasing the initial crack recording.

4,443,351

SILICONE HYDRAULIC FLUIDS AND ADDITIVE CONCENTRATES THEREFOR

Joseph W. Keil, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Nov. 1, 1982, Ser. No. 437,986

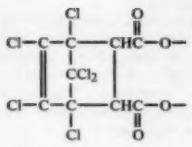
Int. Cl.³ C10M *3/44, 1/50*

U.S. Cl. 252—75 **22 Claims**

1. A composition consisting essentially of

(A) 50 to 96 parts by weight of a polydiorganosiloxane having a viscosity of from about 1.00×10^{-5} m^2/second to about 1.00×10^{-4} m^2/second at 25° C., said polydiorganosiloxane having the formula $R'R_2SiO(Me_2SiO)_x(MeRSiO)_ySiR_2R'$, wherein Me represents the methyl radical, each R represents a monovalent radical selected from the group consisting of hydrocarbon radicals containing from 1 to 6 carbon atoms, and halogenated hydrocarbon radicals containing from 1 to 6 carbon atoms, each R' represents a radical selected from the group consisting of R radicals, the hydride radical, and the hydroxy radical, x has an average value of 8 or more and y has an average value of from 0 to about 2,

(B) 2.5 to 40 parts by weight of a chlorendate diester having the formula $R''O_2CQCO_2R''$, wherein $—O_2CQCO_2—$ represents the chlorendate residue,



and each R'' represents a radical selected from the group consisting of alkyl radicals containing from 4 to 10 carbon atoms and the tetrahydrofurfuryl radical,

(C) 0.5 to 20 parts by weight of a lubricant compound selected from the group consisting of N,N-dialkyldithiocarbamates of lead and antimony, and dialkylphosphorodithioates of lead and antimony, and

(D) 1 to 10 parts by weight of a block copolymer comprising from about 65% by weight to about 90% by weight polydimethylsiloxane blocks, and from about 10% by weight to about 35% by weight polybutadiene or hydrogenated polybutadiene blocks, the total parts of (A) plus (B) plus (C) plus (D) being 100 parts by weight.

4,443,352

SILICATE-FREE BLEACHING AND LAUNDERING COMPOSITION

Guy Broze, Grace-Hollogne, and Leopold Laitem, Orp-le-Grand, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 4, 1982, Ser. No. 354,860

Int. Cl.³ C11D *3/395*

U.S. Cl. 252—94 **9 Claims**

1. A process for bleaching which comprises contacting the stained and/or soiled material to be bleached with an aqueous solution of a granular bleaching detergent composition comprising:

(a) a bleaching agent comprising a peroxyacid compound and/or a water-soluble salt thereof; and

(b) at least one surface active agent selected from the group consisting of anionic, cationic, nonionic, ampholytic and zwitterionic detergents; said bleaching detergent composition being substantially free of silicate compounds.

4,443,353

AQUEOUS BLEACHING AGENT WITH CLEANING ACTION

Nicolaas A. I. Van Paassen, Bodegraven, Netherlands, assignor to Chem-Y Fabriek Van Chemische Producten B.V., Bodegraven, Netherlands

Filed Aug. 3, 1982, Ser. No. 404,652

Claims priority, application Netherlands, Aug. 15, 1981, 8103829

Int. Cl.³ C11D *1/06, 3/395, 17/08*

U.S. Cl. 252—103 **9 Claims**

1. An aqueous bleaching agent having increased viscosity and having cleaning action composed of an alkali metal hypochlorite, at least one surfactant and an alkali metal hydroxide wherein 0.1 to 30 grams of said surfactant are present per 100 grams of said alkali metal hypochlorite and said surfactant is selected from compounds having the general formula $R—(OCH_2CH_2)_xOCH_2COOM$, wherein said formula R represents an alkyl group having from 8 to 18 carbon atoms, x is a number representing a narrow distribution of the average number of oxyethylene units and having an average value of 0.5 to 8 and M represents an alkali metal atom, wherein said compounds having an narrow distribution of the average number of oxyethylene units are derived from an ethoxylated alcohol obtained by reacting an alcohol with ethylene oxide under the influence of a Friedel-Crafts type acid catalyst, said alcohol having the formula ROH wherein R represents an alkyl group having from 8 to 18 carbon atoms.

4,443,354

SORBENT MATERIAL FOR REDUCING FORMALDEHYDE EMISSION

Gilbert L. Eian, White Bear Lake, Minn., assignor to Minnesota Minning and Manufacturing Company, St. Paul, Minn.

Filed Mar. 26, 1982, Ser. No. 362,309
Int. Cl.³ B01J *20/32, 19/04;* B01D *53/14*
U.S. Cl. 252—190 10 Claims

1. Granular sorbent material for removal of formaldehyde from ambient air comprising a high surface area solid support impregnated with a water soluble, substantially non-volatile impregnating agent containing a sufficiently reactive primary or secondary substituted trivalent nitrogen site bearing zero or two carbonyl substituents attached directly to the nitrogen site and having equivalent weight of said reactive nitrogen site of less than about 400.

4,443,355

DETERGENT COMPOSITION

Moriyasu Murata, Chiba; Akira Suzuki, Funabashi; Atsuo Nakae, Saitama, and Susumu Ito, Tochigi, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 23, 1983, Ser. No. 507,426
Claims priority, application Japan, Jun. 25, 1982, 57-109473
Int. Cl.³ C11D *3/386;* C12N *9/42*
U.S. Cl. 252—174.12 2 Claims

1. A detergent composition which comprises 0.01 to 70 percent by weight of a cellulase produced by alkalophilic bacteria of the genus of Cellulosmonas and the balance of cleaning agents.

4,443,356

LIQUID SCINTILLATION COMPOSITION FOR LOW VOLUME BIOLOGICAL SPECIMENS

Arjun Mallik, Pequannock, and Harold Edelstein, Fair Lawn, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Sep. 16, 1982, Ser. No. 418,756
Int. Cl.³ C09K *11/06;* G01T *1/204*
U.S. Cl. 252—301.17 9 Claims

1. A liquid scintillation composition comprising:
a. an aromatic liquid capable of capturing energy from radiation;
b. at least one fluor compound;
c. a mixture of anionic and nonionic surfactants,
said nonionic surfactants comprising octylphenoxy polyethoxy ethanol and nonylphenoxy polyethoxy ethanol and the anionic surfactants comprise dioctyl sulfosuccinate and monosodium ethoxylated alcohol half ester of sulfosuccinic acid.

4,443,357

HYDROPHOBIC SILICA OR SILICATE, COMPOSITIONS CONTAINING THE SAME AND METHODS FOR MAKING AND USING THE SAME

James E. Maloney, Eagan, and Thomas R. Oakes, Stillwater, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jan. 12, 1981, Ser. No. 224,149
Int. Cl.³ B01D *19/04;* C09C *3/08*
U.S. Cl. 252—321 16 Claims

1. A substantially hydrophobic, particulate, porous or agglomerated silica or silicate containing at least about 40 mole-% SiO_2 as silica or silicate, the hydrophobic particulate silica or silicate being the reaction product of the components consisting essentially of:
(a) a hydrophilic, particulate, porous or agglomerated silica or silicate containing at least about 40 mole-% SiO_2 as silica or silicate, the porous or agglomerated particles of which have an average particle size larger than 0.1 micrometers but small enough to be generally nonsettling, and
(b) a hydrophobic aliphatic primary or secondary alcohol substantially free of hydrophilic groups, said reactants (a) and (b) having been heated together in admixture to a temperature above 100° C. until the reactants interact to form said reaction product wherein the ratio of silica or silicate to alcohol comprises 0.25:1 to 20:1.

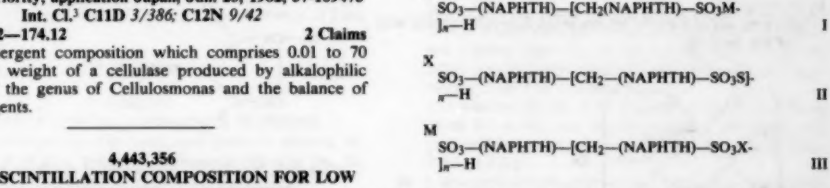
4,443,358

NONCRYSTALLIZING AQUEOUS SOLUTIONS OF METAL SALTS OF NAPHTHALENE SULFONIC ACID-FORMALDEHYDE CONDENSATION PRODUCTS

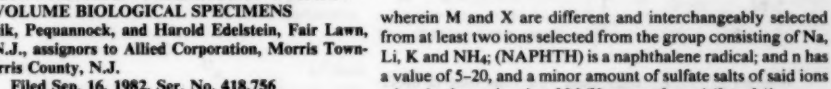
Robert M. Fry, Raynham, Mass., assignor to ICI Americas Inc., Wilmington, Del.

Filed Nov. 15, 1982, Ser. No. 441,780
Int. Cl.³ B01F *17/12;* C04B *7/35*
U.S. Cl. 252—353 12 Claims

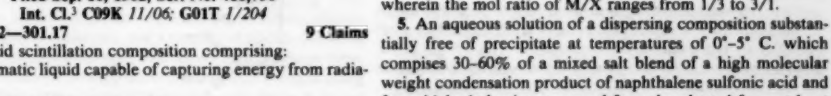
1. An aqueous solution of a dispersing composition substantially free of precipitate at temperatures of 0°-5° C. which comprises 30-60% of a mixed salt blend of a high molecular weight condensation product of naphthalene sulfonic acid and formaldehyde having a general formula selected from at least two of the following:



M
SO_3—(NAPHTH)—[CH_2(NAPHTH)—SO_3M-
]$_n$—H I



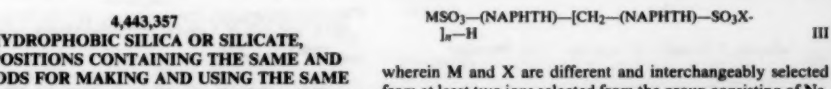
X
SO_3—(NAPHTH)—[CH_2—(NAPHTH)—SO_3S]-
$_n$—H II



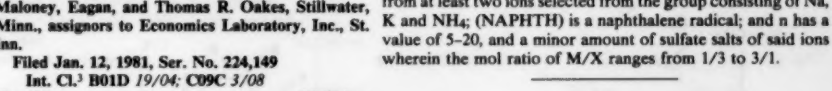
M
SO_3—(NAPHTH)—[CH_2—(NAPHTH)—SO_3X-
]$_n$—H III

wherein M and X are different and interchangeably selected from at least two ions selected from the group consisting of Na, Li, K and NH_4; (NAPHTH) is a naphthalene radical; and n has a value of 5-20, and a minor amount of sulfate salts of said ions wherein the mol ratio of M/X ranges from 1/3 to 3/1.

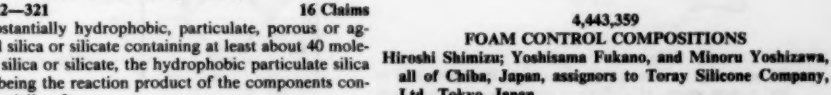
5. An aqueous solution of a dispersing composition substantially free of precipitate at temperatures of 0°-5° C. which compises 30-60% of a mixed salt blend of a high molecular weight condensation product of naphthalene sulfonic acid and formaldehyde having a general formula selected from at least two of the following:



MSO_3—(NAPHTH)—[CH_2—(NAPHTH)—SO_3M-
]$_n$—H I



XSO_3—(NAPHTH)—[CH_2—(NAPHTH)—SO_3X-
]$_n$—H II



MSO_3—(NAPHTH)—[CH_2—(NAPHTH)—SO_3X-
]$_n$—H III

wherein M and X are different and interchangeably selected from at least two ions selected from the group consisting of Na, K and NH_4; (NAPHTH) is a naphthalene radical; and n has a value of 5-20, and a minor amount of sulfate salts of said ions wherein the mol ratio of M/X ranges from 1/3 to 3/1.

4,443,359

FOAM CONTROL COMPOSITIONS

Hiroshi Shimizu; Yoshisama Fukano, and Minoru Yoshizawa, all of Chiba, Japan, assignors to Toray Silicone Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1982, Ser. No. 367,185
Int. Cl.³ B01D *19/04*
U.S. Cl. 252—358 3 Claims

1. A composition to control foaming consisting essentially of
(A) 100 parts by weight of an organopolysiloxane having
1. at least one terminal group selected from the group consisting of alkoxy and hydroxyl groups, and

2. a viscosity range of 10 to 100,000 centistokes at 25° C.,

(B) 0.1 to 50 parts by weight per 100 parts by weight of Component (A) of an organic silicon compound, having the general formula R_2SiZ_2, wherein R is an unsubstituted or substituted monovalent hydrocarbon group, and Z is a hydrolyzable group containing nitrogen, and

(C) 1 to 50 parts by weight per 100 parts by weight Component (A) of a silica.

4,443,360

OIL-SOLUBLE ZINC CYCLIC HYDROCARBYL DITHIOPHOSPHATE-SUCCINIMIDE COMPLEX AND LUBRICATING OIL COMPOSITIONS CONTAINING SAME

Elaine S. Yamaguchi, El Cerrito, and Thomas V. Liston, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

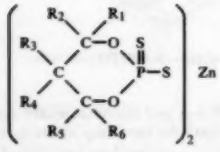
Filed Apr. 19, 1982, Ser. No. 369,706

Int. Cl.³ C10M *1/48*

U.S. Cl. 252—46.7 **12 Claims**

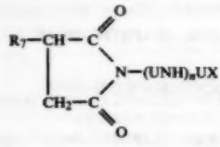
1. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and a minor proportion sufficient to inhibit oxidation and corrosion of a complex prepared by reacting:

(a) a zinc salt of a cyclic hydrocarbyl dithiophosphoric acid of the formula:

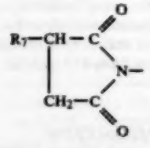


wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different and each is hydrogen or alkyl of 1 to 3 carbon atoms with the proviso that at least one of R_1 through R_6 is alkyl of from 1 to 3 carbon atoms; with

(b) an oil-soluble alkenyl or alkyl mono- or bis-succinimide of the formula:



wherein X is amino or a group of the formula:

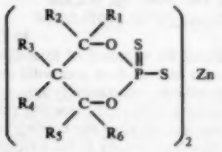


R_7 is an alkenyl or alkyl group containing from about 20 to 300 carbon atoms; U is alkylene containing 2 to 6 carbon atoms; and n is an integer of from 0 to 6;

wherein the weight ratio of (b) to (a) is in the range of from 3:1 to 25:1.

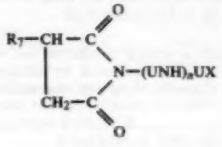
6. A lubricating oil concentrate comprising 10 percent to 90 percent by weight of an oil of lubricating viscosity and from about 10 percent to about 90 percent by weight of an oxidation and corrosion inhibiting complex prepared by reacting:

(a) a zinc salt of a cyclic dithiophosphoric acid of the formula:

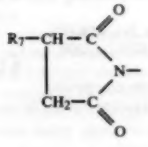


wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different and each is hydrogen or alkyl of 1 to 3 carbon atoms with the proviso that at least one of R_1 through R_6 is alkyl of from 1 to 3 carbon atoms; with

(b) an oil-soluble alkenyl or alkyl mono- or bis-succinimide of the formula:



wherein X is amino or a group of the formula:

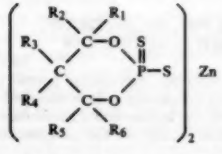


R_7 is an alkenyl or alkyl group containing from about 20 to 300 carbon atoms; U is alkylene containing 2 to 6 carbon atoms; and n is an integer of from 0 to 6;

wherein the weight ratio of (b) to (a) is in the range of from 3:1 to 25:1.

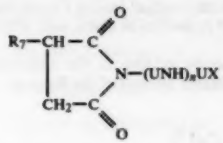
9. A composition comprising a complex prepared by reacting:

(a) a zinc salt of a cyclic dithiophosphoric acid of the formula:

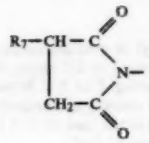


wherein R_1, R_2, R_3, R_4, R_5 and R_6 are the same or different and each is hydrogen or alkyl of 1 to 3 carbon atoms with the proviso that at least one of R_1 through R_6 is alkyl of from 1 to 3 carbon atoms; with

(b) an oil-soluble alkenyl or alkyl mono- or bis-succinimide of the formula:



wherein X is amino or a group of the formula:



R_7 is an alkenyl or alkyl group containing from about 20 to 300 carbon atoms; U is alkylene containing 2 to 6 carbon atoms; and n is an integer of from 0 to 6;

wherein the weight ratio of (b) to (a) is in the range of from 3:1 to 25:1.

4,443,361

SILICON CARBIDE RESISTANCE ELEMENT

Frank J. Hierholzer, Jr., Florissant, and Gerald L. Shelton, St. Louis, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 236,377, Feb. 20, 1981. This application Apr. 1, 1983, Ser. No. 481,448

Int. Cl.³ H01B *1/04*

U.S. Cl. 252—516 **1 Claim**

1. A silicon carbide resistance element comprising an elongated silicon carbide shape having a coating of silicon carbide on it denser than its substrate, and a coating of silicon nitride on said coating of silicon carbide, said silcon carbide shape without the silicon nitride coating having at least one hot spot along its length when current is sent through it, said shape is doped with nitrogen, and doping of the shape at said hot spot is deeper than doping at areas of said shape outside said hot spot, whereby variations in the heating of parts of the doped shape with the passage of current therethrough are minimized.

4,443,362

DETERGENT COMPOUNDS AND COMPOSITIONS

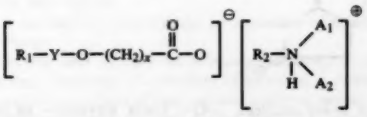
Jacob J. Guth, Upper Black Eddy, Pa., and Robert J. Verdicchio, Succasunna, N.J., assignors to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Jun. 29, 1981, Ser. No. 278,284

Int. Cl.³ C11D *1/88*; C07C *101/04, 101/20*

U.S. Cl. 252—545 **10 Claims**

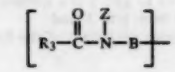
1. A complex of the formula



wherein

R_1 is alkyl or substituted alkyl containing from about 6 to 18 carbon atoms and mixtures thereof;

R_2 is alkyl containing from about 8 to 18 carbon atoms and mixtures thereof or alkyl amido of the formula



wherein

R_3 is alkyl containing from about 7 to 17 carbon atoms;

Z is H or lower alkyl containing from 1 to 4 carbon atoms; and

B is lower alkyl containing from 1 to 4 carbon atoms;

x is an integer from 1 to 3;

A_1 and A_2 are the same or different and are selected from the group of anionic salt moieties consisting of the following:

$-CH_2CH_2-COOX]_n$

$-CH_2-COOX]_n$

$-CH_2CHOH-CH_2-SO_3X]_n$

$-CH_2-CHOH-CH_2-OPO_3X]_n$

wherein X is a water soluble cation and n is an integer of 1 or 2 with the proviso that if only one of A_1 and A_2 are selected from the anionic salt moieties above, the other can be lower alkyl or lower hydroxyalkyl containing from 1 to 4 carbon atoms;

and wherein the pH of the complex is in the range from about 6.5 to 8.5 and wherein the ratio of alkoxylated carboxylate to amphoteric is within the range of from 0.5:1 to 1.5:1.

10. A detergent composition wherein the active ingredients comprise from about 1 to 50% by weight of the total composition of at least one complex of the formula of claim 1.

4,443,363

DETERGENT COMPOSITION FOR CLEANING HARD SURFACES AND METHOD OF USING THE SAME

Wolfgang Klinger, Altötting, and Eckhard Milewski, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,767

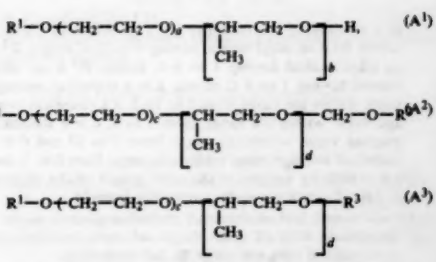
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048642

Int. Cl.³ C11D *1/38*

U.S. Cl. 252—547 **9 Claims**

1. A detergent composition for the mechanical cleaning of hard surfaces in aqueous alkaline liquors, which comprises

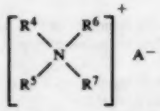
(A) 20 to 95% by weight of a nonionic surfactant of the formula



or of a mixture of the formulae (A^1), (A^2) and/or (A^3), in which R^1 is an alkyl radical having 6 to 18 C atoms, R^2 is an alkyl radical having 1 to 4 C atoms, R^3 is an alkyl radical having 1 to 4 C atoms, a is a statistical average value within the range from 3 to 6, b is a statistical average

value within the range from 3 to 5, c is a statistical average value within the range from 6 to 12 and d is a statistical average value within the range from 0 to 3, and

(B) 5 to 80% by weight of a cationic surfactant of the formula



in which R^4, R^5 and R^6 are identical or different and are alkyl radicals having 1 to 8 C-atoms and R^7 is an alkyl radical having 1 to 4 C-atoms or a benzyl radical, and A denotes an anion.

4,443,364

DETERGENT COMPOSITION CONTAINING AN ANTIFOAMING AGENT FOR CLEANING HARD SURFACES AND METHOD OF USING THE SAME

Wolfgang Klinger, Altötting, and Eckhard Milewski, Kriftel, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 14, 1981, Ser. No. 330,768

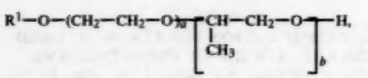
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048641

Int. Cl.³ C11D 1/38

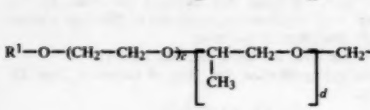
U.S. Cl. 252—547 **10 Claims**

1. A detergent composition for the mechanical cleaning of hard surfaces in aqueous alkaline cleaning liquors, which comprises

(A) 20 to 95% by weight, of the total weight of the mixture A+B, of a nonionic surfactant of the formula

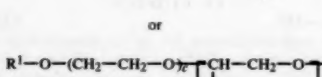


(A^1)



(A^2)

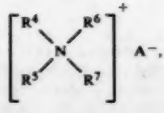
or



(A^3)

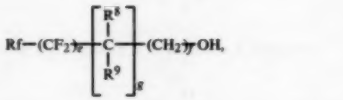
or a mixture of the formulae (A^1), (A^2) and/or (A^3), in which R^1 is an alkyl radical having 6 to 22 C atoms, R^2 is an alkyl radical having 1 to 6 C atoms, R^3 is an alkyl radical having 1 to 4 C atoms, a is a statistical average value within the range from 2 to 10, b is a statistical average value within the range from 1 to 8, c is a statistical average value within the range from 5 to 20 and d is a statistical average value within the range from 0 to 3, and

(B) 5 to 80% by weight, of the total weight of the mixture A+B, of a cationic surfactant of the formula



in which R^4 and R^5 are identical or different alkyl radicals having 1 to 12 C atoms, R^6 is an alkyl radical having 1 to 8 C atoms and R^7 is an alkyl radical having 1 to 4 C atoms or a benzyl radical, and A denotes an anion, and, additionally,

(C) 0.001 to 20% by weight, relative to the total weight A+B=100, of a fluorinated alcohol of the formula



in which Rf is a perfluoromethyl or perfluoroisopropyl radical, R^8 is an alkyl radical having 1 to 3 C atoms, R^9 is hydrogen or an alkyl radical having 1 to 3 C atoms, e denotes an integer from 5 to 15, f denotes an integer from 0 to 4 and g assumes the value 0 in the case of f=1 to 4, and assumes the value 1 in the case of f=0.

4,443,365

METHOD FOR DETERMINATION OF THE VALPROIC ACID AND REAGENTS THEREIN

Noriyuki Sunahara, Kyoto; Shunsuke Naruto, Ikoma; Akira Kagemoto, Osaka; Shigeru Kurooka, Fujiidera, and Kanae Yokogawa, Nara, all of Japan, assignors to Dainippon Pharmaceutical Company Limited, Osaka, Japan

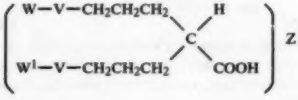
Filed Jun. 24, 1981, Ser. No. 276,794

Claims priority, application Japan, Jul. 1, 1980, 55-90403

Int. Cl.³ C07G 7/00, 7/02

U.S. Cl. 260—112 R **7 Claims**

1. Compound of the formula:



wherein

V is a bond or lower alkylene,

W is a bond to Z, or a group of the formula:

—CO—$((U)_p(U^1)_q(U^2)_r)$,

—NH—$((U)_p(U^1)_q(U^2)_r)$,

—S—$((U)_p(U^1)_q(U^2)_r)$,

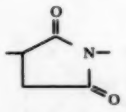
=CH—$((U)_p(U^1)_q)$,

=C_f=N—$((U)_p(U^1)_q(U^2)_r)$ or

—N=N—

wherein

U is —NH—, —N=N—, —N=CH— or



U^1 is lower alkylene, —O— lower alkylene— or lower arylene,

U^2 is —O—, —CO—, —COO— or

—O— lower arylene—,

p,q and r are each 0, 1 or 2, and t is 0 or 1,

W^1 is hydrogen atom, a bond to Z, or a group of the formula:

—CO—$((U)_p(U^1)_q(U^2)_r)$,

—NH—$((U)_p(U^1)_q(U^2)_r)$,

—S—$((U)_p(U^1)_q(U^2)_r)$,

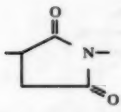
=CH—$((U)_p(U^1)_q)$,

=C_t=N—$((U)_p(U^1)_q(U^2)_r)$ or

—N=N—

wherein

U is —NH—, —N=N—, —N=CH— or



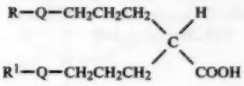
U^1 is lower alkylene, —O— lower alkylene or lower arylene,

U^2 is —O—, —CO—, —COO— or —O— lower arylene,

p, g and r are each 0, 1 or 2, t is 0 or 1, and

Z is a protein, or salts thereof.

5. A conjugate of a compound of the formula:



wherein

Q is a bond or lower alkylene,

R is —NH_2, —SH, —CHO, —COOH or —$COCH_2$—halogen,

R^1 is hydrogen atom, —NH_2, —SH, —CHO, —COOH or —$COCH_2$—halogen,

or salts thereof with an enzyme,

wherein the enzyme is bonded to at least one of R and R^1 of the compound directly; or by one of the glutaraldehyde method, periodate method, dimaleimide method, N-(m-maleimidobenzoyloxy)succinimide method, mixed anhydride method, carbodiimide method, toluene diisocyanate method and diazo-method.

4,443,366

GEL CHROMATOGRAPHY MATERIAL

Teruo Sakagami; Noriyuki Arakawa, and Naohiro Murayama, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 169,462, Jul. 16, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 363,401

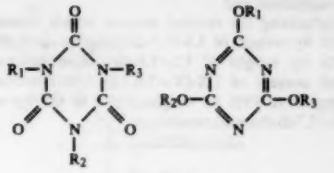
Claims priority, application Japan, Jul. 20, 1979, 54-92337

Int. Cl.³ C08F *226/10*; C07G *7/00*

U.S. Cl. 260—112 R **2 Claims**

1. A method for fractionation of a mixture of substances, comprising:

subjecting said mixture of substances selected from the group consisting of a mixture of vitamins, a mixture of proteins, a mixture of enzymes and mixtures thereof to gel chromatography through a filter bed of a cross-linked copolymer of vinylpyrrolidone and a cross-linking agent obtained by copolymerization of 100 parts by weight of vinylpyrrolidone and 0.5 to 100 parts by weight of said cross-linking agent having a triazine ring system of the formula (I) or (II):



(I) (II)

wherein R^1, R^2 and R^3 each are the same or different and are selected from the group consisting of —CH_2—CH=CH_2, —CH_2—C≡CH and —CH_2—$C(CH_3)$=CH_2 in a diluent.

4,443,367

PEPTIDE AND PEPTOLIDE SUBSTRATES FOR MAMMALIAN COLLAGENASE

Harold I. Weingarten, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 8, 1982, Ser. No. 366,520

Int. Cl.³ C07C *103/52*; C12Q *1/38*

U.S. Cl. 260—112.5 R **3 Claims**

1. A peptide material having activity as a substrate for collagenase selected from the group consisting of

R_1—Pro—Leu—Gly—Ile—Leu—Gly—Leu—R_2,

R_1—Gly—Pro—Leu—Gly—Ile—Leu—Gly—Ala—R_2,

R_1—Pro—Leu—Gly(O—Ile)—Leu—R_2,

R_1—Pro—Leu—Gly(O—Leu)—Leu—R_2, and

R_1—Pro—Leu—Gly(O—Leu)—Ala—R_2,

wherein

R_1=H or N-protecting group, and

R_2=terminal amide, carboxyl or ester group.

4,443,368

PEPTIDES AFFECTING GONADAL FUNCTION

Nancy M. Sherwood, Victoria, Canada; Lee E. Eiden; Michael J. Brownstein, both of Bethesda, Md.; Joachim Spiess, Encinitas, Calif.; Jean E. F. Rivier, and Wylie W. Vale, Jr., both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Nov. 1, 1982, Ser. No. 437,949

Int. Cl.³ C07C *103/52*

U.S. Cl. 260—112.5 LH **7 Claims**

1. A peptide composition consisting essentially of a peptide having the formula:

pGlu-His-Trp-Ser-Tyr-Gly-Trp-Leu-Pro-Gly-NH_2.

4,443,369

SULPHUR DYESTUFFS

Helmut Seidler, Bonn; Manfred Söll, and Klaus Wunderlich, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 43,058, May 29, 1979, abandoned. This application Jul. 20, 1981, Ser. No. 284,918

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832215

Int. Cl.³ C07G *17/00*

U.S. Cl. 260—131 **1 Claim**

1. A sulphur dyestuff obtained by:

a. dinitrating anthraquinone;

b. partially removing 1,5- and 1,8- and 1,6- and 1,7-dinitroanthraquinones; and

c. sulphurizing the residual mixture which contains 25 to 60% by weight of 1,6-/1,7-dinitroanthraquinones, 60 to 25% by weight of 1,5-/1,8-dinitroanthraquinones, the total content of 1,X-(X=5,6,7,8) dinitroanthraquinones being 50 to 85% by weight, and 2 to 6% by weight of 2,6-/2,7-dinitroanthraquinones.

4,443,370

CHROME-COMPLEX DYES

Alois Püntener, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 28, 1981, Ser. No. 267,311

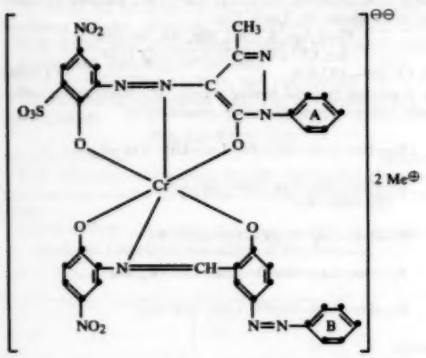
Claims priority, application Switzerland, Jun. 5, 1980, 4345/80

Int. Cl.³ C09B *45/00*

U.S. Cl. 260—145 B **4 Claims**

1. A chrome-complex dye of the formula (I)

(I)



wherein the phenyl groups A and B independently of one another are each unsubstituted or are mono- or disubstituted by chlorine, methyl, ethyl, methoxy or ethoxy, and wherein $Me^{\oplus}$ is a cation.

4,443,371

TRISAZO BLACK DYES

Andre T. Brulard, Villerot, and Andre A. Gerbaux, Baudour, both of Belgium, assignors to Althouse Tertre, S.A., Brussels, Belgium

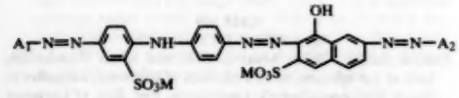
Filed Sep. 9, 1981, Ser. No. 300,564

Claims priority, application Belgium, Sep. 16, 1980, 202118

Int. Cl.³ C09B *35/37*; D06P *1/39, 3/32*

U.S. Cl. 260—169 **12 Claims**

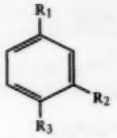
1. A trisazo dye of the structure:



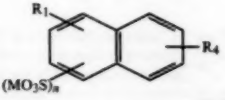
in which

M represents H, Na, K, Li, or $N(R)_3H$ wherein R represents H, CH_3, C_2H_5, C_3N_7, $-CH_2CH_3OH$, $-CH_2CH(OH)CH_3$ or $-CH_2CH_2OCH_2CH_2OH$;

A_1 and A_2, which may be identical or different, represent a coupling component which contains at least one amino group of a hydroxy group and has the structure:



(where the azo linkage is other than meta to the R_1 and R_2 substituents) or



(where the azo linkage is ortho or para to the R_1 and R_4 substituents), and in which

M has the above meaning;

R_1 represents $-NH_2$ or $-OH$;

R_2 represents $-NH_2$, $-OH$, $-O-$alkyl, $-NHCO$ lower alkyl, $-NH$ aryl, $-NH$ lower alkyl, $-N$(lower alkyl)$_2$ and $-NHCH_2COOM$;

R_3 represents hydrogen, a lower alkyl or SO_3M;

R_4 represents $-H$, $-NH_2$, $-OH$, $-O-$alkyl, $-NHCO$ lower alkyl, $-NHCO$ lower alkyl, $-NH$ aryl, $-NH$ lower alkyl and $-NHCH_2COOM$; and

n=0, 1 or 2.

4,443,372

1-ALKYL DERIVATIVES OF 3-ARYLOXY-4-(2-CARBALKOXY)-PHENYL-AZET-2-ONES AS PLANT GROWTH REGULATORS

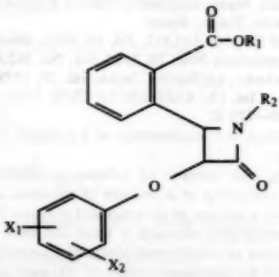
Tatao Luo, El Sobrante; Louis Russo, Walnut Creek, and Francis J. Freenor, III, Richmond, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Jun. 23, 1982, Ser. No. 391,798

Int. Cl.³ C07D *205/08*; A01N *43/44*

U.S. Cl. 260—239 A **10 Claims**

1. A compound of the formula:



wherein R_1 is methyl or ethyl; R_2 is lower alkyl; and X_1 and X_2 are independently hydrogen or halogen.

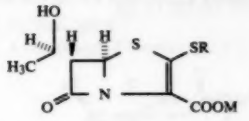
4,443,373

PROCESS FOR THE PRODUCTION OF ANTIBIOTIC PENEMS

Vlyyoor M. Girijavallabhan, Parsippany; Ashit K. Ganguly, Upper Montclair; Patrick A. Pinto, Mine Hill, and Richard W. Versace, Ringwood, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

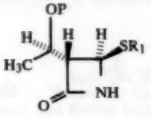
Filed Mar. 30, 1982, Ser. No. 363,710
Int. Cl.³ C07D *499/04, 499/00*
U.S. Cl. 260—245.2 R 16 Claims

1. A process for the production of penems of the formula I:



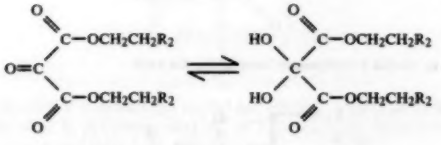
(I)

wherein R is methyl, ethyl, propyl, or isopropyl; and M is an alkali metal cation;
which comprises:
(a) reaction of an azetidinone of the formula II



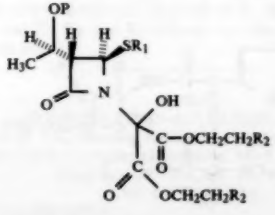
(II)

wherein P is a removable hydroxy protecting group; and R_1 is a sulfur protecting group selected from triphenylmethyl, 2-pyranyl, or lower alkyl carbonyl;
with a compound of the formulae IIIa and IIIb



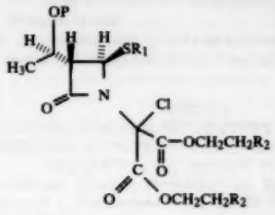
(IIIa) (IIIb)

wherein R_2 is a trimethylsilyl, cyano, t-butyl diphenylsilyl or a sulfone ester of the formula $—SO_2R^1$ wherein R^1 is an aryl; to form the intermediate of the formula IV



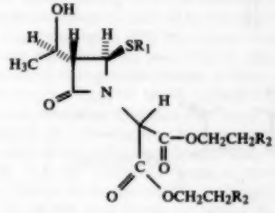
(IV)

wherein R, R_1 and R_2 are as hereinabove defined;
(b) treatment of the compound of formula IV with a chlorinating agent to form a compound of the formula V



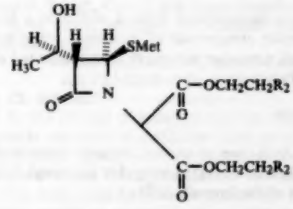
(V)

wherein P, R_1 and R_2 are as hereinabove defined;
(c) treatment of the compound of formula V with elemental zinc to effect removal of the chlorine and the removable hydroxy protecting group, and, if a removable hydroxy protecting group is utilized which is not removable with zinc, subsequent removal of said hydroxy protecting group, producing a compound of the formula VI



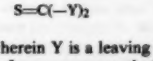
(VI)

where R_1 and R_2 are as hereinabove defined;
(d) treatment of the compound of formula VI with a reactive silver, copper or mercury salt to form a compound of the formula VII



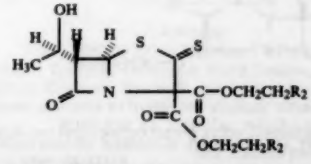
(VII)

wherein R_2 is hereinabove defined and Met is silver, copper or mercury;
(e) reaction of the intermediate of formula VII with a thiocarbonyl compound of the formula VIII



(VIII)

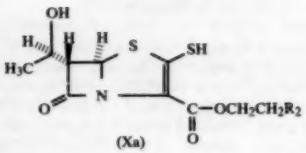
wherein Y is a leaving group;
to form a compound of the formula IX



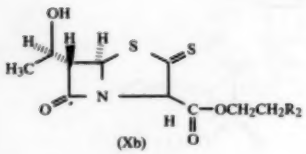
(IX)

wherein R_2 is as hereinabove defined;
(f) treatment of the compound of formula IX with one equiv-

alent of fluoride ion to form the compound of the formulae Xa and Xb



(Xa)



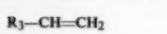
(Xb)

wherein R_2 is as hereinabove defined;

(g) reaction of the compound of formulas Xa and Xb with either a compound of formula XI

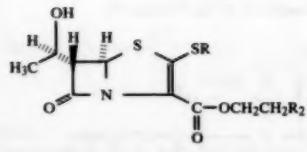
(XI)

wherein R is as hereinabove defined and Z is a leaving group, to make compounds of formula I wherein R is methyl, ethyl, propyl or isopropyl; or a compound of the formula XII



(XII)

wherein R_3 is hydrogen or methyl, to make compounds of formula I wherein R is ethyl, propyl or isopropyl; forming a compound of the formula XIII



(XIII)

wherein R is methyl, ethyl, propyl or isopropyl and R_2 are as hereinabove defined; and

(h) treatment of a compound of formula XIII with another equivalent of fluoride ion to form a compound of formula I.

4,443,374

PROCESS FOR PREPARING (3S)-3-[[(2-AMINO-4-THIAZOLYL)[(1-CARBOXY-1-METHYLETHOXY)IMINO]-ACETYL]AMINO]-2-OXO-1-AZETIDINESULFONIC ACID, AND 4-SUBSTITUTED DERIVATIVES

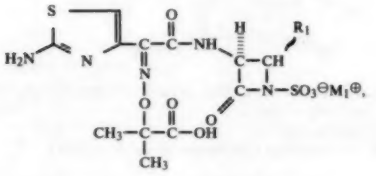
Christopher M. Cimarusti, Pennington; Rita T. Fox, Princeton; Alan W. Fritz, Kendall Park; William H. Koster, East Amwell Township, Hunterdon County, and Jerome L. Moniot, Chester, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 1, 1982, Ser. No. 344,895

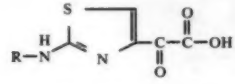
Int. Cl.[3] **C07D** *417/12, 205/08;* **A61K** *31/425*

U.S. Cl. 260—245.4 **4 Claims**

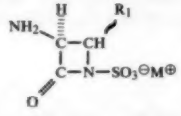
1. A process for preparing a compound having the formula



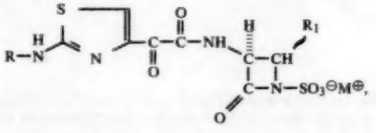
which comprises coupling a compound having the formula



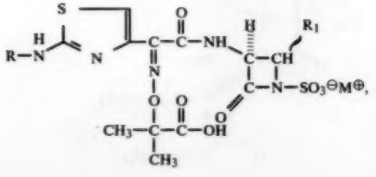
or a salt thereof, with a compound having the formula



to obtain a compound having the formula



reacting that compound with 2-aminooxy-2-methylpropanoic acid, or a salt thereof, to obtain a compound having the formula



and, if R is an amino protecting group, deprotecting that compound to yield the desired product; wherein

R is hydrogen or an amino protecting group

R_1 is hydrogen, methyl or ethyl;
$M^{\oplus}$ is an inorganic cation or a pyridinium, triethylammonium, or tetrabutylammonium ion; and
$M_1^{\oplus}$ is the same as $M^{\oplus}$ or hydrogen.

4,443,375

TETRAHYDROIMIDAZO(3,4-C)-1,3-DIAZOCINE INTERMEDIATES FOR PRODUCTION OF GUANIDINES

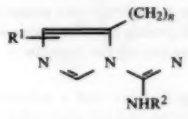
Derek W. Hills, Welwyn Garden City, and George R. White, Harpenden, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 270,072, Jun. 3, 1981, Pat. No. 4,375,435. This application Oct. 26, 1982, Ser. No. 436,894

Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.6 **2 Claims**

1. A compound of formula (X)



(X)

where n is 4;
R^1 is attached to a carbon atom in the imidazole moiety and is hydrogen, halogen or alkyl; and R^2 is cyano or benzoyl.

4,443,376

GEM-DIPEROXYESTERS

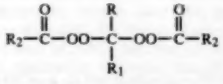
Ronald L. Pastorino, Larkspur; Lawrence A. Bock, Walnut Creek, and Reidar Halle, Novato, all of Calif., assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Division of Ser. No. 166,210, Jul. 7, 1980, Pat. No. 4,370,459. This application Sep. 27, 1982, Ser. No. 424,820

Int. Cl.³ C07C *179/14*

U.S. Cl. 260—453 RZ **8 Claims**

1. An organic peroxide of the formula:



where R is selected from methyl and ethyl; R_1 is ethyl when R is ethyl; R_1 is hydroxyalkyl of 1 to 7 carbon atoms when R is methyl; and each R_2 is

where each of R_3, R_4, and R_5 is selected from hydrogen and alkyl, provided not more than one of R_3, R_4, and R_5 is hydrogen, and R_3, R_4, and R_5 collectively containing from 2 to 12 carbon atoms.

4,443,377

ISOMERIZATION-ACYLATION PROCESS

Verlan H. Van Rheenen, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 20, 1982, Ser. No. 419,843

Int. Cl.³ C07J *5/06*

U.S. Cl. 260—397.4 **5 Claims**

1. A process for the preparation of 17α-hydroxy-6-methyl-16-methylenepregna-4,6-diene-3,20-dione 17-acetate which comprises

(1) contacting 17α-hydroxy-6,16-dimethylenepregn-4-ene-3,20-dione with an acetylating agent in the presence of a strong acid and

(2) recovering the 17α-hydroxy-6-methyl-16-methylenepregna-4,6-diene-3,20-dione 17-acetate.

4,443,378

PROCESS FOR THE SEPARATION OF ACYLATED PHOSPHOLIPIDS FROM PHOSPHATIDYLCHOLINE PRODUCTS CONTAINING THE SAME

Bernd-Rainer Günther, Bergheim, Fed. Rep. of Germany, assignor to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,326

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047012

Int. Cl.³ A23J *7/00*; C07F *9/02*; C11C *3/00*

U.S. Cl. 260—403 **5 Claims**

1. Process for the separation of acylated phospholipids from phosphatidylcholine products containing the same characterized in that the phosphatidyl starting material is dissolved in a lower alkanol having from 1 to 4 carbon atoms or a mixture of several such alkanols, said alkanol or mixture of alkanols possibly containing up to 20% by volume, possibly present insolubles are separated from said solution, said clear solution is put on to a chromatographic column of silicic acid gel at a temperature ranging from 60° to 90° C., said column is eluated at an elevated temperature within this range with a lower alkanol having from 1 to 4 carbon atoms or a mixture of several such lower alkanols, said alkanol or said mixture possibly containing up to 20% by volume of water, a preeluate containing the by-products to be separated is collected, thereafter, separate therefrom, the main eluate containing the pure phosphatidylcholine is collected and the solvent is separated from said main eluate.

4,443,379

SOLID BLEACHING COMPOSITION FOR EDIBLE OILS

Dennis R. Taylor, Covina, and Zenon Demidowicz, Los Angeles, both of Calif., assignors to Harshaw/Filtrol Partnership, Oakland, Calif.

Filed Mar. 17, 1982, Ser. No. 358,995

Int. Cl.³ C11B *3/06, 3/00*; C09F *5/10*

U.S. Cl. 260—427 **9 Claims**

1. In the process of reducing the free fatty acis content of vegetable oils using a molecular sieve as treating agent, the improvement which comprises treating the vegetable oils, subsequent to the refining of the oils with an alkali metal hydroxide, with a free fatty acid removal and decolorizing composition consisting essentially of a major portion of an acid-activated subbentonite clay and a minor portion of a Y-zeolite, wherein the acid-activated clay component of the composition is in the range from about 75 to about 95% by weight and the Y-zeolite content is in the range from about 5 to about 25% by weight, the zeolite being characterized by a residual sodium ion content of less than about 5% by weight which residual sodium ion content is obtained by exchange of the balance of the sodium ions with cations of alkaline earth metals, lanthanides, transition metals other than Group VIII metals, or mixtures of these; separating the treated oils from the composition.

4,443,380

ORGANIC EUROPLUM SALT PHOSPHOR

Katsuhiko Yamazoe, Yokohama; Akira Yoshino, Fujisawa; Yoshiharu Kitahama, Kawasaki, and Isamu Iwami, Zushi, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Filed Aug. 22, 1980, Ser. No. 180,324

Claims priority, application Japan, Aug. 31, 1979, 54-110357; Jul. 8, 1980, 54-92214

Int. Cl.³ C09K *11/46*

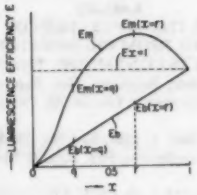
U.S. Cl. 260—429.2 **4 Claims**

1. An organic rare-earth salt phosphor comprising a crystal-

line rare-earth metal salt of an organic acid represented by the general formula:

$$[A(COO)_l]_mZ$$

wherein:



$[A(COO)_l]$ denotes a carboxylic acid radical derived from an organic carboxylic acid $[A(COOH)_l]$ selected from the group consisting of cinnamic acid, 3-5-dimethoxycinnamic acid and beta-(pyridyl) acrylic acid,

Z is europium,

l denotes 1 or 2, and

$m=3/l$.

4,443,381

DIRECT EXCHANGE PROCESS

Milton Braid, 11 MacArthur Blvd., Westmont, N.J. 08108

Filed Jul. 7, 1980, Ser. No. 166,662

Int. Cl.³ C10M *1/54*; C07F *15/02, 15/04*; C10M *3/48*

U.S. Cl. 260—439 R **17 Claims**

1. A process of preparing transition metal-containing derivative reaction products of calcium phenol sulfides which comprises reaction of said sulfides with a transition metal salt in a multi-phase solvent system in the presence of an alcoholic reaction accelerator or promoter, said solvent system being characterized by having a minimal degree of solubility for said reactants and wherein said reaction products are soluble in at least one phase of said solvent system and the displaced calcium salt produced by said reaction is insoluble in said solvent system.

4,443,382

ALUMINUM SALTS OF AROMATIC SULFONIC ACIDS FORMALDEHYDE CONDENSATES

Stanley A. Lipowski, Livingston, N.J., assignor to Diamond Shamrock Chemicals Company, Dallas, Tex.

Filed Feb. 3, 1982, Ser. No. 345,238

Int. Cl.³ C07F *5/06*

U.S. Cl. 260—448 R **7 Claims**

1. An aluminum salt of an aromatic sulfonic acid formaldehyde condensate wherein the salt is a reaction product of an aromatic sulfonic acid formaldehyde condensate with freshly prepared aluminum hydroxide.

4,443,383

PREPARATION OF METHACROLEIN AND METHACRYLONITRILE FROM TERT-BUTYL ALKANOATES

Joseph W. Nemec, Rydal, and Michael S. Cholod, Cornwells Heights, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 245,296, Mar. 19, 1981, Pat. No. 4,358,622, which is a continuation-in-part of Ser. No. 84,255, Oct. 12, 1979, abandoned. This application Jul. 21, 1982, Ser. No. 400,491

Int. Cl.³ C07C *120/00, 121/32*

U.S. Cl. 260—465.2 **1 Claim**

1. A process for preparing methacrylonitrile by the vapor phase catalytic ammoxidation of tert-butyl alkanoate wherein the alkyl moiety of the alkanoate radical has from one to four carbon atoms in the presence of oxygen and ammonia at a temperature in the range of from about 200° to 600° C. wherein the catalyst is based on oxide combinations selected from Mo-Co, Mo-Bi, Mo-Fe, Mo-P or Mo-Bi-Fe-Co which may also contain Ni, Sb, Te, W, Cs, K, Cu or combination thereof.

4,443,384

PROCESS FOR THE MANUFACTURE OF MIXED PHOSPHORIC ACID ESTER COMPOSITIONS

Joseph H. Finley, Metuchen, and Hsiang P. Liao, Princeton, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Oct. 4, 1982, Ser. No. 432,471

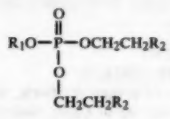
Int. Cl.³ C07F *9/09*

U.S. Cl. 260—982 **4 Claims**

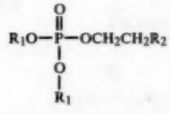
1. A process for the manufacture of a mixed phosphoric acid ester composition comprising less than about 4 weight percent of triphenyl phosphate having the formula:

$$(R_1O)_3P{=}O$$

from about 10 to about 20 weight percent of a phenyl dialkyl phosphate having the formula:



and from about 65 to 80 weight percent of an alkyl diphenyl phosphate having the formula:



wherein R_1 is a phenyl radical and R_2 is an alkyl radical, which comprises:

(a) heating about 2 moles of an alcohol characterized by a boiling point above about 170° C. and having the formula:

$$R_2CH_2CH_2OH$$

with a catalytic amount of from greater than about 1.5 mole percent to about 2.0 mole percent based on the alcohol of an aqueous sodium hydroxide solution under vacuum to distill off the water present in the mixture and form a sodium alkoxide;

(b) adding about 1.0 mole of triphenyl phosphate of the formula:

$$(R_1O)_3P{=}O$$

to the reaction mixture under a nitrogen atmosphere and maintaining the temperature at about 100° C. with agitation for about an hour;

(c) heating the reaction mixture at 100° C. to 140° C. under vacuum to remove aromatic and aliphatic alcohols from the reaction mixture; and

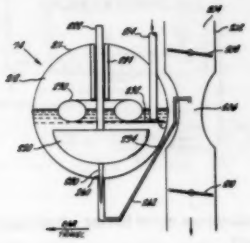
(d) distilling the filtrate in a wiped film still under vacuum and at a temperature below the decomposition temperature of said mixed phosphoric acid ester composition to obtain the desired product.

4,443,385

FUEL SYSTEM FOR VEHICLES

Herman Laub, 244 N. San Marino Ave., San Gabriel, Calif. 91775

Division of Ser. No. 230,038, Jan. 30, 1981, Pat. No. 4,366,781.
This application Sep. 22, 1982, Ser. No. 421,370
Int. Cl.³ F02M 5/06
U.S. Cl. 261—18 A 13 Claims



1. A carburetor for a fuel comprising a first liquid and a second liquid mixable with the first liquid, the first liquid having a lower density and a higher fuel content than the second liquid, the carburetor comprising:

(a) a housing having a fuel inlet and a fuel outlet, the fuel outlet being at the bottom of the housing;

(b) a first float in the housing above the outlet, the first float having a selected density such that the vertical distance between the first float and the outlet is directly proportional to the second liquid content of the fuel in the housing and is independent of the amount of the fuel in the housing; and

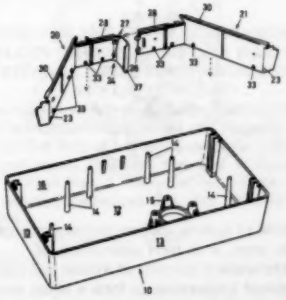
(c) means coupled to the first float for varying the cross-sectional area of the outlet in response to the distance between the first float and the outlet.

4,443,386

EVAPORATIVE COOLER PAD FRAME SUPPORT

Robert W. Wrightson, St. Marys, Australia, assignor to F.F. Seeley Nominees Pty. Ltd., St. Marys, Australia

Filed Jun. 14, 1982, Ser. No. 387,925
Claims priority, application Australia, Jun. 19, 1981, PE9366
Int. Cl.³ B01F 3/04
U.S. Cl. 261—29 10 Claims



1. Support means for supporting evaporative pad frames and their pads in an evaporative cooler of the type having a water tank, a water spreader located above the tank, a motor driven blower between the spreader and the tank, and a pump arranged to pump water from the tank to the spreader, the pad frames being at a distance from the blower and extending downwardly from the spreader towards the tank to intercept water when discharged from the spreader, said support means comprising:

a baffle and means locating the baffle to be upstanding from the base of the tank, the locating means comprising a plurality of baffle locating spigots upstanding from the base and a corresponding plurality of tabs outstanding from the baffle, each said tab having an aperture the walls of which slidably engage a respective said spigot when the baffle is within the tank,

support surfaces on the upper edge of the baffle supporting and locating the lower ends of the respective said pad frames, and

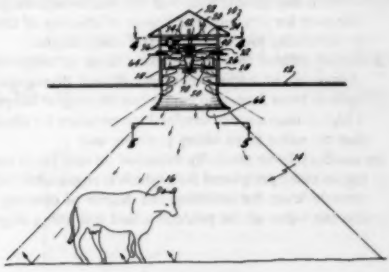
a flange depending from the periphery of the spreader engaging and locating the upper ends of said frames.

4,443,387

EVAPORATIVE COOLING DEVICE AND PROCESS FOR COOLING LARGE AREAS

R. Robert Gordon, 11300 Chimineas Ave., Northridge, Calif. 91326

Filed Jan. 5, 1982, Ser. No. 337,165
Int. Cl.³ B01F 3/04
U.S. Cl. 261—30 26 Claims



1. A process for cooling a mass of air which comprises:

locating a housing in conjunction with said mass of air, said housing of the type having an air inlet and an air outlet;

extracting an air stream from said mass of air and moving said air stream through said air inlet of said housing into said housing and discharging said air stream out of said air outlet of said housing;

increasing the residence time of said air stream in said housing by introducing a torsional motion into said air stream within said housing to cause said air stream to move in a spiral pathway within said housing;

injecting a spray of water into said air stream as it moves in said spiral pathway within said housing, at least a portion of said water spray evaporating into said air stream while said air stream resides in said housing;

said spray of water being ejected under a pressure and through a nozzle orifice of a size to create a droplet size less than 0.004 inches and greater than 0.002 inches, and directing said moist air stream downwardly from said air outlet in an expanding pattern and into contact with animals therebelow in order to cool said animals.

4,443,388

DEVICE FOR ADJUSTING THE DEGREE OF OPENING OF THE THROTTLE VALVE OF A CARBURETOR

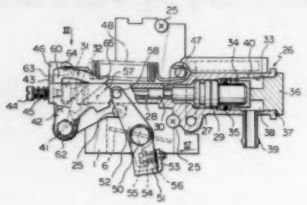
Mitsuyoshi Teramura; Masatami Takimoto, both of Toyota; Norihiko Nakamura, Mishima; Takaaki Itoh, Mishima; Takashi Katou, Mishima; Toshiharu Morino, Mie, and Youzou Sakakibara, Kariya, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Sep. 14, 1982, Ser. No. 417,868

Claims priority, application Japan, Dec. 22, 1981, 56-206056

Int. Cl.³ F02M *3/06*

U.S. Cl. 261—39 A **10 Claims**



1. A device for adjusting the degree of opening of the throttle valve of a carburetor having a valve shaft which supports the throttle valve, said device comprising:

a housing;

a pivot mounted on said housing;

a throttle lever mounted on the valve shaft and being rotatable with the throttle valve;

a cam pivotally mounted on said pivot and having a cam face which is engageable with said throttle lever during engine warm-up for retaining the degree of opening of the throttle valve at a predetermined fast idling degree;

actuating means for rotating said cam in response to a change in the engine temperature and disengaging said throttle lever from said cam when the engine temperature is higher than a predetermined temperature for closing the throttle valve to an idling position; and

an auxiliary lever pivotally mounted on said pivot and having an outer peripheral face which is engageable with said throttle lever for retaining the degree of opening of the throttle valve at the predetermined fast idling degree.

4,443,389

HEAT EXCHANGE APPARATUS

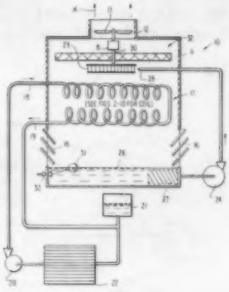
Diego E. F. Dodds, Buenos Aires, Argentina, assignor to Leonard Oboler, Key Biscayne, Fla., a part interest

Continuation-in-part of Ser. No. 258,136, Apr. 27, 1981, This application Jul. 7, 1981, Ser. No. 281,151

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—153 **24 Claims**

1. In a light weight cooling tower having helical coils having smooth external surfaces and carrying heated water from a facility in a closed circuit system, said coils being mounted such that surface movements as by multidirectional thermal expansion and contraction of said coils crack scale and other film from said smooth external surfaces thereof, the improvement wherein the internal flow path of heated fluid in said closed circuit system includes turbulator means to enhance agitation and vibration of said coils thereby increasing the efficiency and avoiding the build up of scale on said smooth external surfaces of said cooling coils due to the flow of the cooling water thereover, said helical coils being formed of



lightweight aluminum metal having a high temperature expansion coefficient.

4,443,390

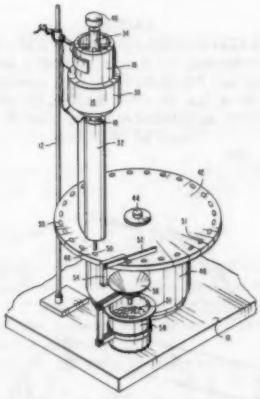
METHOD FOR MAKING AMALGAM PELLETS

William L. Brundige, West Caldwell, N.J., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1982, Ser. No. 361,213

Int. Cl.³ B01D *2/02*

U.S. Cl. 264—13 **5 Claims**



1. The method of making sodium-mercury amalgam pellets comprising the steps, in an inert atmosphere, of:

heating predetermined amounts of sodium and mercury to a predetermined temperature to form a liquid amalgam;

releasing droplets of said liquid of predetermined volume from an orifice situated above a rotating disc;

receiving said droplets on said rotating disc at predetermined intervals;

solidifying said droplets into pellet form on said disc during rotation thereof; and

dislodging said formed pellets from said disc and delivering said pellets into a container.

4,443,391
PROCESS OF MAKING ARTICLES OF FOAMED POLYMETHYL METHACRYLATE

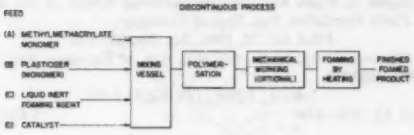
Bernd Melchior, Burger Strasse 255, D 5630 Remscheid, Fed. Rep. of Germany, assignor to August Hohnholz KG, Hamburg; Imchemie Kunststoff GmbH, Wermelskirchen and Bernd Melchior, Remscheid, all of, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,337

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1981, 3124980

Int. Cl.³ B29D *27/04*

U.S. Cl. 264—22 **16 Claims**



1. A process of making articles of foamed polymethyl methacrylate comprising

(1) mixing

(a) 100 parts by weight of monomeric methyl methacrylate;

(b) 5 to 40 parts by weight of a plasticizer which is a monomeric alkyl methacrylate in which the alkyl group comprises at least 3 carbon atoms;

(c) 10 to 100 parts by weight of a foaming agent that will neither evaporate nor decompose at the polymerization temperature and which is a liquid inert foaming agent boiling at a temperature of less than 100° C.; and

(d) at least one polymerization catalyst;

at a temperature below the evaporation or decomposition temperature of the foaming agent to form a mixture and polymerizing said mixture at a pressure in excess of the evaporation pressure of the foaming agent at the polymerization temperature to form a solid body containing said forming agent, and

(2) positioning said foaming agent-containing solid body on a non-adherent substrate and heating said solid body to a temperature in excess of the evaporation temperature of the foaming agent and in excess of the softening temperature of the polymer to foam said solid body and form a transparent foamed polymethyl methacrylate with closed cells having a diameter of about 5 mm. and a density of about 0.03 to 0.05 g/cm^3.

4,443,392
PROCESS FOR THE PRODUCTION OF MOLDED DECORATIVE ARTICLES FROM A HARDENABLE SUBSTANCE BASED ON THERMOSETTING SYNTHETIC RESIN

Josef Becker, Neunkirchen-Seelscheid; Manfred Simon, Niederkassel; Karl-Heinz Spiess, Much, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Nov. 3, 1981, Ser. No. 317,845

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041794

Int. Cl.³ C04B *41/10*

U.S. Cl. 264—25 **24 Claims**

1. A process for the production of decorated molded articles wherein a base article is produced by compression molding from a hardenable substance containing a minor amount of a thermosetting synthetic resin material and a major amount of at least one inert filler and by providing the article with a surface layer of hardenable lacquer resin which comprises:

(a) producing a non-caking, pourable substance from a homogenous mixture comprising 3 to 7% by weight of a hardenable plastic material, 0 to 3% by weight of calcium stearate, zinc stearate or stearic acid, 0 to 5% by weight of water, alcohol or mixtures thereof, 97 to 85% by weight preferably 96 to 87% by weight of fillers comprising quartz, sand, chalk, heavy spar, corundum, slag, basaltic powder, or aluminum hydroxides or mixtures thereof by drying said mixture to a moisture content of 1 to 3% at temperatures between 50° and 80° C.;

(b) casting the substance into a mold and pressing with a specific pressure of about 100 to 500 kp/cm^2 to form a shaped base article;

(c) extracting the shaped base article from the mold;

(d) hardening the extracted base article at elevated temperatures up to 150° C.;

(e) applying a design-forming decorative layer comprised of a hardenable lacquer or paint containing colorant on at least one part of a surface of the base article;

(f) drying and hardening of the design-forming layer and any still unhardened base article at elevated temperatures up to 150° C.;

(g) eventually applying a synthetic glaze comprised of a hardenable resinous compound to the design-forming layer; and

(h) hardening the synthetic glaze.

4,443,393
METHOD OF PRESSURIZING TREATMENT OF PRE-FOAMED PARTICLES OF POLYOLEFIN RESIN

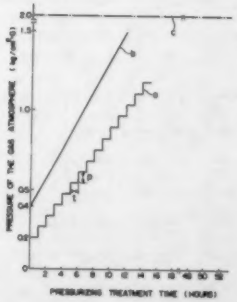
Hiroyuki Akiyama, Hiratsuka; Hideki Kuwabara, Hatano; Toru Yamaguchi, Tsukui, and Masahiko Kishida, Hiratsuka, all of Japan, assignors to Japan Styrene Paper Corporation, Tokyo, Japan

Filed Dec. 7, 1982, Ser. No. 447,670

Claims priority, application Japan, Dec. 9, 1981, 56-199115

Int. Cl.³ C08J *9/22*

U.S. Cl. 264—53 **2 Claims**



1. A method for pressurizing pre-foamed particles of a polyolefin resin by maintaining the pre-foamed particles in an atmosphere of a pressurized gas to impart thereto an internal pressure of from 0.2 to 2.5 kg/cm^2(G), which comprises subjecting the particles while at room temperature or elevated temperature to an initial pressure of not more than 0.5 kg/cm^2(G) by feeding an inorganic gas or a mixture of an inorganic gas and a blowing agent into a vessel, and said initial pressure not causing shrinkage to the particles, and thereafter gradually increasing the applied pressure stepwise or continuously at a rate of not more than 0.2 kg/cm^2(g) per hour until the pressure reach 0.7 to 3 kg/cm^2(G), said step of increasing the applied pressure not causing shrinkage to the particles.

4,443,394

METHOD OF MAKING A SILICON NITRIDE BODY FROM THE $Y_2O_3/SIO_2/SI_3N_4/AL_2O_3$

Andre Ezis, Grosse Ile, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01110, 371 Date Jul. 19, 1983, 102(e) Date Jul. 19, 1983
PCT Filed Jul. 19, 1983, Ser. No. 527,641
Int. Cl.³ C04B 35/50
U.S. Cl. 264—65 17 Claims

1. A method of making a silicon nitride comprising product, by the steps of:

(a) fabricating a unitary, porous, reaction bonded object comprising silicon nitride, yttrium silicon oxynitride, and alumino-silicate, said yttrium silicon oxynitride being chemically formed from an SiO_2 component and being present in an amount of 5–17% by weight of said object, said alumino-silicate being present in an amount up to 3% by weight of the object; and

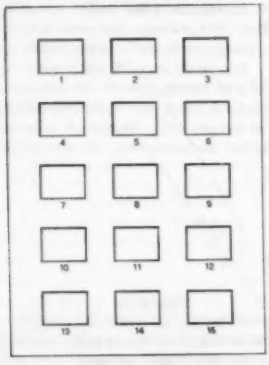
(b) heating said object in an ambient atmosphere, without the use of mechanical or gaseous over-pressure to a temperature level below the sublimation temperature of said silicon nitride and for a period of time effective to substantially full densify the object as a result of the solution of said silicon nitride into liquified yttrium silicon oxynitride.

4,443,395

METHOD FOR PREPARING THIN SECTIONS FOR THE MICROSCOPIC STUDY OF SMALL FRAGMENTS OF ROCK OR DUST, USING A PLATE CONTAINING CELLS

Valerio Motta, Milan, Italy, assignor to AGIP, S.p.A., Rome, Italy

Continuation-in-part of Ser. No. 377,940, May 13, 1982, abandoned, which is a continuation of Ser. No. 266,609, May 22, 1981, abandoned, which is a continuation of Ser. No. 781,066, Mar. 24, 1977, abandoned. This application Sep. 1, 1982, Ser. No. 413,765
Claims priority, application Italy, Mar. 29, 1976, 21665 A/76
Int. Cl.³ B29C 6/00, 17/12, 23/00; B29D 3/00
U.S. Cl. 264—117 2 Claims



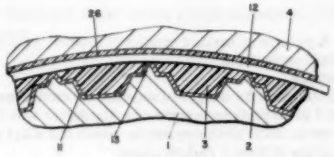
1. The method of preparing thin sections for the microscopic study of small fragments of material obtained from well cuttings and the like, said fragments being selected from the group consisting of rock, dust and microfossils, comprising: mixing said fragments with a suitable epoxy resin having a refractive index at 25° C. between 1.47 and 1.596 to form an agglomerate of fragments and resin which will not stick to a plate of plastic material containing a plurality of mold cavities, then forming at least one pellet by placing the agglomerated fragments and resin in at least one of said cavities, each cavity having the shape of a truncated rectangular pyramid with a depth of about 3.5 mm, a major base of 21.0×28.0 mm and a minor base of 20.5×27.5 mm, filling said cells with said pellets, heating said pellets in said cells to a temperature not exceeding 75° C. to cure each pellet, removing the cured pellets from said cells, and thereafter mechanically grinding each of said cured pellets to a uniform thickness in the range of from 50 to 20μ to produce a specimen having optimum transparency with a fragment density in each specimen which is at least from about 1 to 25 times greater than the fragment density heretofore attained.

4,443,396

METHOD OF PRODUCING A LENGTH OF FLEXIBLE TUBING IN THE FORM OF A TOOTHED BELT AND A MOLDING TOOL THEREFOR

Rudolf Breher, Porta Westfalica, Fed. Rep. of Germany, assignor to Breco Kunststoffverarbeitungs GmbH & Co. KG, Porta Westfalica, Fed. Rep. of Germany

Filed Jul. 28, 1981, Ser. No. 287,596
Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031330
Int. Cl.³ B29F 1/10; B29H 9/02
U.S. Cl. 264—136 5 Claims



2. A method for producing a length of flexible tubing in the form of a toothed belt comprising the steps of

selecting a mould comprising a core having teeth and notches therebetween with an annular holding surface at an end of the core with a diameter substantially that of the core at the notches, and a sleeve adapted to surround the core, wherein the sleeve has a pot-shape with an open upper end, with the surface of the mould core being cold,

partially filling said pot-shaped mould sleeve with said elastomer material,

placing a peripherably stretchable fabric cover on the mould core,

winding a reinforcing insert on the fabric cover,

covering at least at said one end of the mould core the cross sections of the tooth notches between the teeth by radially contracting said edge of the fabric cover,

attaching the edge of the fabric cover sealingly to said holding surface, the latter constituting a non-toothed part of the mould core,

initially inserting the mould core with said fabric cover and said reinforcing insert starting with said mould core portion containing said edge of the fabric cover into the pot-shaped mould sleeve, the elastomer material which is contained in the mould sleeve being thereby displaced to fill the mould cavity between the mould core and the mould sleeve, finishing the insertion of said mould core into said sleeve such that thereupon with a piston-like impressing of said top cover of said mould cover into said mould sleeve the open upper end of the sleeve is closed and the elastomer material is enclosed and placed under pressure, as a result of which pressure the fabric cover which is stretchable in the peripheral direction of the mould core is pressed down in to the tooth notches of the mould core and brought against the cold surface of the mould core.

3. The method according to claim 2, further comprising the step of

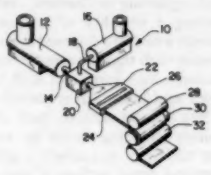
impregnating the fabric cover before it is used on the mould core only on one side with a layer of the elastomer material so as to form a solidified cold impregnation layer, and wherein said placing step provides for

placing the fabric cover around the mould core such that the solidified cold impregnation layer faces away from the surface of the mould core.

4,443,397
MULTIPLE-LAYERED SHEETING APPARATUS AND PROCESS THEREFOR

Granville J. Hahn, and Raleigh N. Rutledge, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Aug. 16, 1982, Ser. No. 408,105
Int. Cl.³ B29F *3/04*
U.S. Cl. 264—171 17 Claims



1. A co-extrusion apparatus for the production of multi-layered products of thermoplastic synthetic resins having selected numbers of layers, comprising:

a main extruder for producing a main heat-plasticized resin stream;

at least one co-extruder for producing a side heat plastified resin stream;

a co-extrusion feedblock positioned downstream of said extruder and said co-extruder for receiving said main resin stream and said side resin stream and for producing a combined resin stream, said co-extrusion block comprising at least one slotted plate having a central orifice which provides for the passage of said main resin stream and slotted portions on either side of said central orifice for laying down layers of said side resin stream upon said main resin stream, conduit means within said co-extrusion block for splitting said side resin stream and supplying sub-streams thereof to said slotted portions, and adjustment means for varying the volume of flow to any level necessary in each of said sub-streams, said adjustment means being internal to said co-extrusion block and comprising means for external adjustment thereof; and

a sheeting die downstream of said co-extrusion block for receiving said combined stream and for forming the multi-layered product into a multi-layered sheet.

11. A process for producing a multi-layered sheeting, comprising the steps of:

extruding a base layer stream of a heat-plastified material;

co-extruding at least one side stream of a heat-plastified material;

passing said base layer stream through a co-extrusion feedblock;

passing each said side stream into said feedblock;

splitting each said side stream in said feedblock into a plurality of sub-streams;

selectively controlling the flow rate of said sub-streams within said feedblock by external adjustment thereof;

selectively passing at least one of said sub-streams to a selected plate member attached to said feedblock, said plate member having a slot for each sub-stream communicating with said base layer stream passing through said plate member;

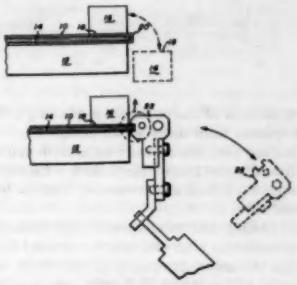
laying down at least one layer of said sub-stream upon said base layer stream at said plate member to produce a multi-layered stream; and

passing said multi-layered stream through an extrusion die to form the multilayered sheeting.

4,443,398
FORMING PROCESS FOR LIGHT GAUGE POLYMER SHEET MATERIAL

Lawrence G. Martinelli, San Jose, Calif., and Mark R. Garrison, Minden, Nev., assignors to Verbatim Corporation, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 102,777, Dec. 12, 1979, Pat. No. 4,294,640. This application Jul. 27, 1981, Ser. No. 287,271
Int. Cl.³ B29C *25/00, 17/02;* B65D *85/30;* B31F *1/00*
U.S. Cl. 264—235 7 Claims



5. A method for forming a moving web of light gauge polymeric material into a substantially warp-free folded article comprising the steps of:

folding a moving web of light gauge polymeric material of polycarbonate about moving sizing terminal ends of a continuous folding mandrel by means of a series of progressive forming rollers whereby a folded edge is formed in said web, said web of material being essentially at room temperature, and said sizing terminal ends moving in synchronism with said web;

clamping said moving web as folded about said synchronously moving sizing terminal ends between a first moving continuous belt pressure track and a second moving continuous belt pressure track, said continuous belt pressure tracks moving in synchronism with said web as folded about said synchronously moving sizing terminal ends with said moving web retained in said folded condition substantially without slippage with respect to said sizing terminal ends and said moving continuous belt pressure tracks, and with said sizing terminal ends of said folding mandrel along with said moving web which said terminal ends protruding slightly beyond the edges of said continuous belt pressure tracks;

applying heat uniformly along said folded edge of said retained moving web by contacting an outer surface of said said web with a series of heated shaping rollers formed to mate with said outer surface of said web along said folded edge, said outer surface of said web being heated thereby to a temperature sufficient to relieve internal stress present in said folded edge of said web; and

cooling said heated edge of said moving web to a temperature below said material's glass transition temperature while maintaining said moving web in a clamped position about said terminal ends by means of said continuous belt pressure tracks; wherein

said folding forms an article having a substantially 180° flat fold; and

a surface of said heated shaping rollers shaped to mate with said outer surface of said sheet is a U-shaped trough; whereby the slight protrusion of said terminal ends of said moving web beyond said edges of said continuous belt pressure tracks allows said U-shaped trough to accept the edge of said 180° flat fold of said moving web therein.

4,443,399

METHOD OF PRODUCING BIAXIALLY ORIENTED SHEET OR FILM AND APPARATUS THEREFOR

Masao Takashige; Kazuhisa Kaneda, and Naotaka Murakami, all of Chiba, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1982, Ser. No. 370,240
Claims priority, application Japan, May 7, 1981, 56-68598
Int. Cl.³ B29F *3/08*
U.S. Cl. 264—519 **15 Claims**

1. A method of continuously producing a biaxially oriented thermoplastic resin sheet which comprises:

extruding a molten thermoplastic resin in a horizontal direction of travel from a die to form a tube of said resin while injecting a fluid under pressure into the hollow interior of said tube;

then passing said tube horizontally through a sizing mold immediately after said tube is extruded from said die, such that the outer periphery of said tube conforms to said mold, said sizing mold thereby maintaining said tube in the same shape;

cooling said tube to a temperature lower than the softening point of said resin, whereby said tube is not deformed by internal pressure exerted by said fluid;

then passing said tube further horizontally in the direction of travel thereof by means of a transfer speed regulating mechanism which engages the outer periphery of said tube;

then passing said tube through a heating zone wherein said tube is subjected to a temperature gradient such that the lower vertical outer surface of said tube is heated to an extent greater than the upper vertical outer surface of said tube, the upper half of said tube being additionally heated by upwardly directed convection heating, whereby the temperature of said tube is increased substantially uniformly as said tube continues to move horizontally to a temperature higher than the softening point of said resin but lower than the melting point thereof, the diameter of said tube remaining substantially constant;

then passing said tube horizontally out of said heating zone and into a necking zone defined by a plurality of necking members which guide, support and define the shape of said tube as said tube passes therebetween, said tube being at an orientation temperature;

then simultaneously biaxially orienting said tube as said tube continues to move horizontally by expanding said tube radially to form a bubble-shaped portion of said tube by means of said internal fluid pressure, and said bubble-shaped, oriented portion of said tube moves at a speed faster than the speed of transfer of said tube in the horizontal direction;

then collapsing and thereby folding said bubble-shaped portion of said tube, while heating said bubble-shaped portion, to thereby flatten said tube to form a biaxially oriented, bilayered thermoplastic resin sheet.

8. An apparatus for producing a biaxially oriented, thermoplastic resin sheet which comprises:

an extruder adapted to continuously extrude a molten resin in a horizontal direction of travel to form a tube made of said resin;

pressurized fluid feeding means for injecting a pressurized fluid into the interior of said tube as said tube is formed by said extruder;

a sizing mold provided adjacent to said extruder such that said tube passes through an interior cavity of said mold as said tube is continuously produced by said extruder, said sizing mold being effective to maintain the shape of said tube against pressure exerted by said pressurized fluid;

a cooling mechanism positioned to receive said tube which is moving horizontally from said sizing mold and cool said tube to a temperature below the softening point of said resin;

a transfer speed regulating mechanism having movable surfaces thereof positioned to receive said tube which is moving horizontally from said cooling mechanism and adapted to frictionally engage the outer periphery of said tube and thereby regulate the rate of horizontal movement thereof;

a heating mechanism positioned to receive said horizontally moving tube into an interior chamber thereof from said transfer speed regulating mechanism, said heating mechanism comprising a plurality of horizontally elongated heating elements which are disposed in parallel within said interior chamber such that the axes thereof define a cylindrical formation which surrounds said tube as said tube passes through said heating mechanism, said cylindrical formation being coaxial with the axis of said tube, said heating elements including means for heating the lower vertical outer surface of said tube to a greater extent than the upper vertical outer surface of said tube, the upper vertical half of said tube being additionally heated by convection heating, whereby the temperature of said tube is increased substantially uniformly as said tube continues to move horizontally within said interior chamber of said heating mechanism to a temperature higher than the softening point of said resin but lower than the melting point thereof;

a plurality of necking members positioned to receive therebetween said horizontally moving tube from said heating mechanism, whereby said necking members guide, support and define the shape of said tube as said tube passes therebetween, such that said tube expands to form a bubble-shaped portion thereof due to the pressure of said pressurized fluid after said tube moves horizontally beyond said necking members, whereby said tube is simultaneously biaxially oriented;

a plurality of bubble guiding members positioned to receive said bubble-shaped portion of said tube from said necking members and progressively flatten said bubble-shaped portion as said bubble-shaped portion moves horizontally and contacts said bubble guiding members;

a heating mechanism adapted to heat said bubble-shaped portion of said tube as said bubble-shaped portion is flattened by said bubble guiding members, including means for progressively increasing the degree of heating of said bubble-shaped portion as said bubble-shaped portion continues to move along said bubble guiding members;

a plurality of pinch rolls positioned to receive said flattened, bubble-shaped portion of said tube from said bubble guiding members, said pinch rolls including means for completely collapsing said tube and forming a bilayered resin sheet therefrom; and

a take-up mechanism positioned to receive said resin sheet from said pinch rolls.

4,443,400

METHOD AND APPARATUS FOR THE FORMATION OF PROFILED THERMOPLASTIC FILM

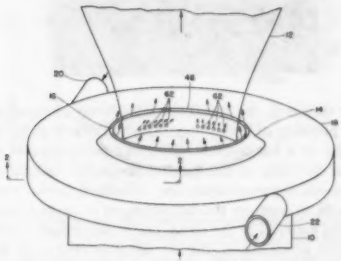
F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 11, 1982, Ser. No. 407,206
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—519 **17 Claims**

1. A method of forming an extruded tubular thermoplastic film having at least one region of a thickened wall profile extending in the longitudinal direction of the extruded tubular film; comprising extruding a molten thermoplastic polymeric material through an annular extrusion die; and passing said extruded tubular film through a cooling zone while said film is

in a heat-plastified condition including subjecting said film to selectively adjustable localized cooling in the region for forming a thickened profile of variable thickness, and subsequently subjecting said tubular film to a selective amount of uniform cooling about the periphery thereof so as to vary the thickness of said film and to form said longitudinally extending thickened profiled region in the wall of the tubular film.

5. An apparatus for the forming of an extruded tubular thermoplastic film having at least one region of a thickened wall profile extending in the longitudinal direction of the extruded film, said apparatus comprising an annular extrusion die for extruding a molten thermoplastic polymeric material to form said film; a cooling ring having a central opening



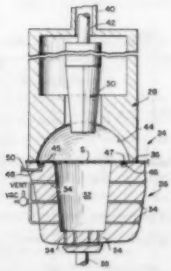
mounted in line with and downstream of said extrusion die wherein the extruded molten polymeric material passes through said central opening, said cooling ring including means for directing a bypass flow of a cooling medium against localized zones along the peripheral surface of said extruded material while said material is in a heat-plastified condition, means for metering the localized bypass flow of said cooling medium for forming said thickened wall profile of variable thickness, and adjustable means in said cooling ring for subsequently directing a uniformly distributed and variable flow quantity of said cooling medium against the peripheral surface of said extruded material so as to form said thickened wall profile region along the zones of said localized cooling while the material is conveyed through said cooling ring.

4,443,401

APPARATUS FOR AND METHOD OF THERMOFORMING PLASTIC CANS

Howard M. Turner, Mount Vernon, Ohio, assignor to The Continental Group, Inc., Stamford, Conn.

Filed Dec. 17, 1981, Ser. No. 331,738
Int. Cl.³ B29C *17/04*
U.S. Cl. 264—544 **11 Claims**



1. In an apparatus for the thermoforming of containers, said apparatus comprising a female mold member defining a mold cavity having an opening defined by a surrounding clamp surface, a clamp overlying said mold member to retain a sheet between said clamp and said mold member, means mounting said mold member and said clamp for relative movement axially of said mold cavity between a sheet clamping position and a molded article releasing position, and a sheet forming plunger carried by said clamp and movable relative to said clamp into said mold cavity for at least effecting an initial forming of a sheet within said mold cavity, the improvement comprising said clamp having a clamping surface surrounding said mold cavity opening and being radially outwardly spaced from said mold cavity opening wherein said clamp is operable to clamp within the confines of said clamp an area of sheet material greatly in excess of the area of said mold cavity opening, said clamp defining a sheet forming cavity opposing said mold cavity, a gas supply means carried by said mold member for initially billowing clamp sheet material upwardly into said sheet forming cavity to enhance biaxial orientation of clamped sheet material, said mold having an annular ledge surrounding said opening and within that portion of said mold opposed in clamping relation by said clamp, and said gas supply means being solely in said ledge closely adjacent said mold portion opposing said clamp for directly impinging gas on a clamped heated plastic sheet to effect stretching of such sheet and billowing thereof into said sheet forming cavity starting at the periphery of that portion of clamped sheet material within said clamp.

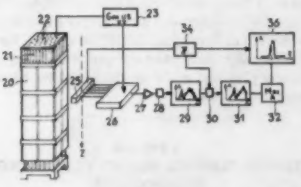
7. A method of thermoforming comprising the steps of providing a mold of the type including a mold cavity surrounded by an annular ledge, positioning a sheet of biaxially orientable plastic heated to a selected temperature in overlying relation to the mold, clamping the sheet against the mold ledge remote from the mold cavity, applying a sheet forming gas under pressure to the sheet from the mold ledge adjacent the clamped portion of the sheet to upwardly billow the sheet beginning generally at the periphery to effect biaxial orientation in said sheet including in a peripheral part of said sheet, engaging the billowed portion of the sheet with a plunger and forcing the sheet axially into the mold cavity, and then expanding the sheet to conform to the configuration of the mold cavity.

4,443,402

METHOD AND APPARATUS FOR DETECTING DEFECTIVE FUEL ELEMENTS IN A NUCLEAR REACTOR FUEL ASSEMBLY

Jean Marini, Marly le Roi, and Alain Gravelle, Le Plessis Robinson, both of France, assignors to Framatome, Courbevoie, France

Filed Oct. 9, 1981, Ser. No. 310,268
Claims priority, application France, Oct. 24, 1980, 80 22789
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—252 **8 Claims**



1. Method of detecting defective fuel elements in a nuclear reactor fuel assembly constituted by a bundle of elongate fuel rods disposed parallel to each other in the longitudinal direction of said assembly, said method comprising the steps of:

(a) keeping said assembly entirely immersed in a protective liquid such as water;

(b) emitting ultrasonic waves at one of the ends of each of said fuel rods successively and propagating said waves over the entire length of said fuel rod;

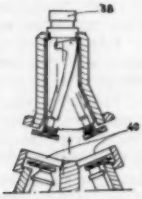
(c) moving an ultrasonic sensor near the fuel rod in which said ultrasonic waves are propagated in its longitudinal direction, during propagation of the waves in said rod;
(d) determining the presence of a defect in said rod by picking up, by means of said sensor, the ultrasonic waves eventually scattered by the defect in said rod into said protective liquid;
(e) determining, when a defect is present, the variations of the amplitude of the signal picked up according to the position of said sensor in the longitudinal direction of said rod; and
(f) determining the position of said sensor for which the amplitude of said signal is maximum corresponding to the position of the defect along the length of said rod.

4,443,403

APPARATUS FOR LOADING AND UNLOADING FUEL ASSEMBLIES FOR A FAST NEUTRON NUCLEAR REACTOR

André Plagnard, Montrouge, France, assignor to Novatome, Le Plessis Robinson, France

Filed Jun. 10, 1981, Ser. No. 272,430
Claims priority, application France, Jul. 1, 1980, 80-14637
Int. Cl.³ G21C *19/20*
U.S. Cl. 376—270 **6 Claims**



1. Apparatus for loading and unloading fuel assemblies, for a fast neutron nuclear reactor, allowing assemblies to be moved between a primary loading and unloading ramp (28) communicating with the vessel of said reactor and a secondary ramp (29) communicating with a region for storing or loading assemblies, comprising a lock-chamber (25) resting on the structure of said reactor, the latter also bearing the primary and secondary ramps (28, 29), said reactor having a transfer means (35) fixed therein, said transfer device comprising at least one ramp pivotable by drive means (36) between a position in communication with said primary ramp (28) and a position in communication with said secondary ramp (29), and at least one apparatus for moving said assemblies inside said ramps (28, 29) connected to said movable ramp (35), said primary and secondary ramps bearing isolating means (32, 33) at their ends, said apparatus being removable as a whole, said lock-chamber (25) being constituted by a removable vessel transportable from one said nuclear reactor to another and including connecting and isolating means (30, 31) at apertures (26, 27) in its wall for placing in communication with said primary and secondary ramps (28, 29) of a reactor at the ends of these ramps provided with isolating means (32, 33).

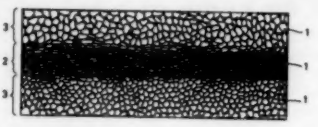
4,443,404

SINTERED POROUS METAL PLATE AND ITS PRODUCTION

Masatoshi Tsuda, Kyoto; Takeshi Kobayashi, Suita, and Katsumi Kaitani, Yao, all of Japan, assignors to Katuragi Sangyo Co., Ltd., Osaka, Japan

Division of Ser. No. 138,332, Apr. 8, 1980, Pat. No. 4,357,393. This application Aug. 11, 1982, Ser. No. 407,038
Claims priority, application Japan, Apr. 10, 1979, 54-43219
Int. Cl.³ B22F *3/00*
U.S. Cl. 419—2 **2 Claims**

1. A process for producing a sintered porous metal plate comprising metal particles directly and integrally bonded together due to sintering, said plate being of porous structure and having a density gradient in the direction of thickness, characterized in that metal particles are charged into a mold having a pair of refractory side walls, refractory bottom wall and electrodes, pressed by a refractory press within the mold until the metal material attains a predetermined initial electric resistance value, an electric current is passed to the electrodes while controlling the current to uniformly heat the metal material approximately up to its transformation point, then the whole material is heated up to the sintering temperature to



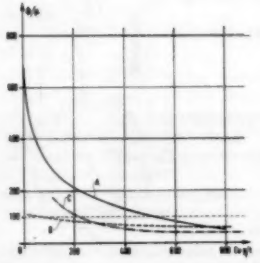
effect the sintering, the metal particles being charged in the mold in a plurality of layers respectively different in the metal particle size or a temperature difference being created layerwise in the direction of thickness of the metal material in the mold, wherein thermocouples are embedded in the press or bottom mold to measure the temperatures at various portions of the metal material in the mold, and in accordance with the temperatures so-measured, the electrical current to be passed to the electrodes is controlled in order to heat the whole metal material or particular layer of the material in the mold substantially uniformly.

4,443,405

LEAD-ANTIMONY ALLOYS FOR ELECTRODE SUPPORTS FOR LEAD ACCUMULATORS

Gerard Dalibard, Sevres, and Nicole Viaud, Ville d'Avray, both of France, assignors to Societe Anonyme dite Compagnie Europeene d'Accumulateurs, Paris, France

Continuation of Ser. No. 168,343, Jul. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 56,937, Jul. 12, 1979, Pat. No. 4,253,871. This application Jun. 30, 1982, Ser. No. 393,530
Claims priority, application France, Jun. 6, 1980, 80 12603
Int. Cl.³ C21B *11/04*
U.S. Cl. 420—573 **6 Claims**



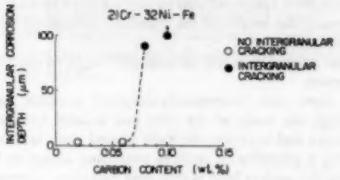
1. An alloy consisting of less than 4% of antimony, between 0.005 and 0.1% of copper, between 0.001 and 0.1% of a mixture of rare earths, between 0 and 0.5% of arsenic, and between 0 and 0.8% of tin, the balance being lead.

4,443,406

HEAT-RESISTANT AND CORROSION-RESISTANT WELD METAL ALLOY AND WELDED STRUCTURE

Masayuki Sukekawa, Kitaibaraki; Yoshimitsu Tobita; Seishin Kirihara, both of Hitachi; Hisashi Morimoto, Hiroshima; Kenichi Usami, and Katsumi Iijima, both of Hitachi, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,797
Claims priority, application Japan, Jan. 22, 1982, 57-7548
Int. Cl.³ C22C *30/00*
U.S. Cl. 420—584 **15 Claims**



1. A heat-resistant and corrosion-resistant alloy consisting of a weld metal that has a 1,000-hr creep rupture strength of at least 4 Kg/mm^2 at 800° C. and a 1,000-hr creep rupture elongation of at least 6% at 800° C. and that consists essentially of, by weight, less than 0.08% of C, 0.1 to 1.0% of Si, 2 to 3% of Mn, 32 to 42% of Ni, 21 to 25% of Cr, 0.8 to 1.7% of Mo, 0.1 to 1.0% of Nb, up to 0.5% of Ti, up to 2% of Co, up to 2% of Cu, up to 1% of W, up to 0.2% of N, up to 1.0% of V, up to 1.0% of Zr, up to 1.0% of Ta and the balance Fe, wherein the following conditions are met:

$Ti + Zr \leqq 1.0\%$;	$Ni + Co \leqq 42\%$;
$W + V \leqq 1.0\%$;	$Nb + Ta \leqq 1.0\%$; and
$4 \leqq Nb/C \leqq 15$.	

4,443,407

ANALYSIS SYSTEM

Melvin S. Weinberg, Nashua, N.H., and Alan D. Cormier, Newburyport, Mass., assignors to Instrumentation Laboratory Inc., Lexington, Mass.

Division of Ser. No. 245,981, Apr. 2, 1981, Pat. No. 4,361,539, which is a continuation-in-part of Ser. No. 146,705, May 5, 1980, abandoned. This application Jun. 23, 1982, Ser. No. 391,102
The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.
Int. Cl.³ G01N *27/30*
U.S. Cl. 422—68 **22 Claims**

6. An analysis system for measuring a parameter of a fluid sample comprising:

two metal heat sink members,

a flow-through cell that defines a flow path for a sample to be analyzed, structure in said cell defining an inlet port, an outlet port, and at least one sensor-accepting-port sensing cavity, the two ports and the cavity being in communication with said flow-path, said cell having parallel opposed faces and being disposed between said heat sink member,

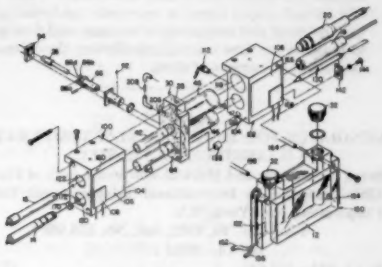
each said heat sink member having a surface in mating heat exchange contact with a corresponding one of said opposed cell faces,

sample analysis electrode structure having a sensing tip at one end thereof and extending through a bore in one of the heat sink members with the sensing tip disposed in sealing engagement in said sensing cavity and forming a portion of the flow path so that the fluid sample in said flow path to be analyzed contacts the tip surface of the sensor,

heater structure in physical contact with each said heat sink member,

a temperature sensor in one of said heat sink members, for sensing the temperature of a heat sink member,

control circuitry responsive to said temperature sensor, for energizing said heater structure to maintain the temperature of said heat sink members and said cell at a predetermined value,



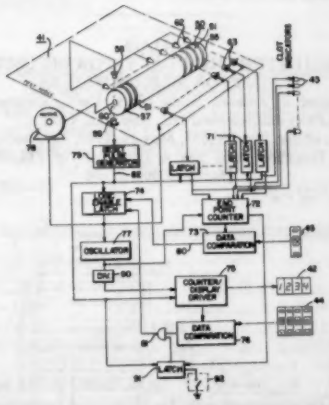
a flush solution flow-through heat exchange structure physically supported in heat exchange contact with said heat sink members and connected to the outlet port of said flow path for stabilizing the temperature of flush solution to be flowed through said sample flow path, preheater flow-through structure disposed in one of said heat sink members and connected to said inlet port for heating sample material being flowed to said flow-through cell for analysis.

4,443,408

APPARATUS FOR ANALYZING THE INFLUENCE OF ADDITIVE REAGENTS UPON THE COAGULATION OF BLOOD

Michael D. Mintz, Edison, N.J., assignor to International Technidyne, Inc., Edison, N.J.

Filed Jul. 9, 1981, Ser. No. 281,661
Int. Cl.³ G01N *33/86*
U.S. Cl. 422—73 **18 Claims**



1. Analysis apparatus for providing an indication determinative of the coagulation time of a blood sample, comprising:

a plurality of detector means each separate one associated with a separate one of a plurality of test chambers with

each of said detectors providing a signal indicative of a clot formed in an associated chamber,

selector means for selecting a predetermined number indicative of the number of clots to be detected in said plurality of chambers, during an analysis,

comparison means responsive to said signals from said detectors and said selected predetermined number to provide an output signal when they are equal, and,

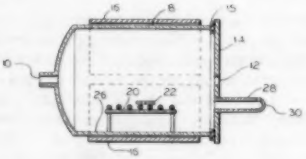
timing means operative to commence operation when said samples are distributed in said test chambers and responsive to said output signal to terminate operation upon the generation of said output signal to cause said timing means to indicate the time interval manifesting the formation of said selected number of clots.

4,443,409

APPARATUS FOR IMPROVED LOW TEMPERATURE ASHING IN A PLASMA

Edward J. Saccocio, and Mark E. Holycross, both of Columbus, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,968
Int. Cl.³ B01J *1/10, 1/12*
U.S. Cl. 422—186.04 **15 Claims**



1. A gaseous plasma reaction apparatus comprising:

a nonmetallic, inorganic cylinder;

a first end wall sealing one end of said cylinder;

a second end wall sealing the other end of said cylinder;

a plurality of electrodes surrounding said cylinder and connected to a source of RF energy;

said second end wall being of metallic conductive material and being connectable to an RF ground common to said source of RF energy;

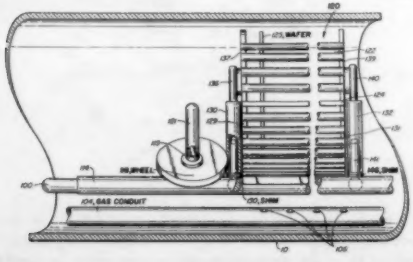
said second end wall having one or more apertures wherein plasma jets may form.

4,443,410

APPARATUS FOR CHEMICAL VAPOR DEPOSITION OF FILMS ON SILICON WAFERS

Constantine J. Zaferes, Santa Clara, Calif., assignor to Advanced Crystal Sciences, Inc., San Jose, Calif.

Division of Ser. No. 150,555, May 16, 1980, Pat. No. 4,309,240. This application Nov. 4, 1981, Ser. No. 318,089
Int. Cl.³ C30B *23/06*
U.S. Cl. 422—245 **3 Claims**



1. In an apparatus for depositing thin films on silicon wafers, the apparatus being of the type having an elongated quartz tube with an exit at one end, heating elements surrounding the exterior of the tube for heating wafers placed within the tube, and a vacuum pump connected to the exit of the tube for evacuating gas from the tube, the improvement comprising:

a. a plurality of generally cylindrically shaped cassettes for holding the wafers within the tube in a spaced-apart mutually parallel arrangement, each of said cassettes having a plurality of longitudinally extending openings spaced about a substantial portion of its cylindrical exterior surface for the passage of gas therethrough;

b. a sled for supporting said cassettes end-to-end and for moving said cassettes and the wafers therein into and out of the quartz tube, said sled having a pair of rails extending generally the length of the cassettes for contact with the quartz tube;

c. means on said rails for varying the height of each of said cassettes;

d. at least one horizontally-oriented conduit inserted through the walls of the tube and located beneath said cassettes and between the rails of said sled, said conduit having a plurality of orifices extending along its length below the wafers held within said cassettes, whereby gas introduced into said conduit exits through said orifices and is dispersed thereby generally vertically upward as a gas curtain; and

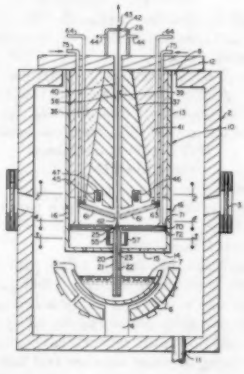
e. means operatively connected to said conduit for injecting gas into both ends of said conduit simultaneously, whereby the local volumetric gas flow rate between adjacent wafers is generally equalized, said gas injecting means including means for controlling the rate of flow into each end of said conduit.

4,443,411

APPARATUS FOR CONTROLLING THE ATMOSPHERE SURROUNDING A CRYSTAL GROWTH ZONE

Juris P. Kalejs, Wellesley, Mass., assignor to Mobil Solar Energy Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 216,370, Dec. 15, 1980. This application Aug. 20, 1981, Ser. No. 294,737
Int. Cl.³ C30B *15/34*
U.S. Cl. 422—246 **10 Claims**



1. An apparatus for growing crystallized silicon in ribbon form comprising, in combination:

(a) crucible means to hold a silicon melt;

(b) heating means to maintain said silicon in melt form;

(c) capillary die means in the form of two elongate parallel die plates defining therebetween a capillary slot, extending from within said melt and being provided at their upper surfaces with means to form of said silicon melt a

meniscus which terminates in a liquid/solid growth interface;

(d) pulling means to withdraw the crystallized silicon ribbon as it forms at said interface;

(e) means to maintain a predetermined thermal gradient in said ribbon as it is withdrawn from said growth interface;

(f) spaced die shields defining therebetween a gas passage, said die shields surrounding the upper end of said capillary die means and defining with the surface thereof a gas flow passage arranged to direct a gas upwardly and essentially uniformly over substantially the entire surface of the melt surface of said meniscus;

(g) gas supply means to supply said gas to said gas passage defined between said spaced die shields; and

(h) means to maintain a controlled atmosphere surrounding said melt surface and said silicon ribbon as it forms at said growth interface.

4,443,412

CRYSTALLIZING APPARATUS

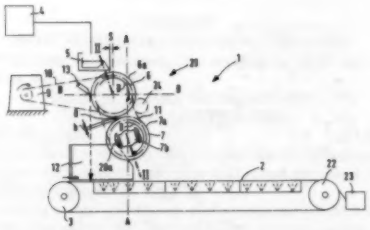
Konrad Schermutzki, Remseck, and Wolfgang Weber, Waiblingen-Beinstein, both of Fed. Rep. of Germany, assignors to Santrade, Ltd., Lucerne, Switzerland

Filed Apr. 1, 1982, Ser. No. 364,443

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1981, 3116277

Int. Cl.³ B01D *9/00;* **C30B** *15/30, 35/00*

U.S. Cl. 422—247 **14 Claims**



1. In a crystallizing apparatus comprising a crystallizing belt and a precrystallizer, wherein nucleation of a melt in the precrystallizer is initiated in a thin layer, followed by crystallizing on the crystallizing belt, to which the precrystallized melt is applied in a thicker layer, the improvement wherein the precrystallizer comprises at least two rolls rotating in the same direction, said at least two rolls being arranged one above the other and both over said crystallizing belt so that the axle of an uppermost one of said at least two rolls is offset in the direction of the onset of the belt relative to the axle of the lowermost one of said at least two rolls, said at least two rolls being arranged so that their peripheral surfaces form therebetween a shear gap at the point of their shortest separation, the width of which being less than the thickness of the melt applied to the uppermost roll, a scraper blade arranged to act on the peripheral surface of the uppermost roll on a side thereof facing in the direction of the onset of the conveyor belt to remove the melt therefrom.

4,443,413

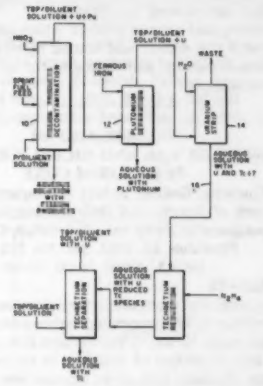
SEPARATION OF URANIUM FROM TECHNETIUM IN RECOVERY OF SPENT NUCLEAR FUEL

David J. Pruett, and Donald R. McTaggart, both of Knoxville, Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 31, 1983, Ser. No. 528,279

Int. Cl.³ C01G *43/00, 57/00*

U.S. Cl. 423—10 **1 Claim**



1. In a spent nuclear fuel recovery process wherein a stream containing U and Tc^{+7} is contacted with an organic phase containing tributyl phosphate and an organic diluent to extract U and and Tc^{+7} from said stream into said organic phase and subsequently U and Tc^{+7} are stripped from said organic phase into an aqueous solution, the improvement comprising:

(1) contacting said aqueous solution with hydrazine to thereby convert the Tc^{+7} therein to a reduced Tc species; and

(2) contacting said aqueous solution containing U and the reduced Tc species with an organic phase containing tributyl phosphate and an organic diluent to extract U from said aqueous solution into said organic phase while leaving substantially all of the reduced Tc species in the aqueous solution.

4,443,414

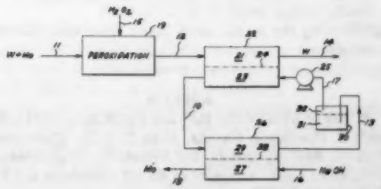
PROCESS FOR SEPARATION OF MOLYBDENUM FROM TUNGSTEN LEACHATES

Bang M. Kim, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1982, Ser. No. 407,964

Int. Cl.³ C01G *39/00, 41/00*

U.S. Cl. 423—54 **6 Claims**



1. A method for the separation of molybdenum and tungsten in leachate solutions containing them, comprising the steps of:

mixing a leachate solution with a hydrogen peroxide to form an aqueous feed solution;

contacting said feed solution with one side of a first porous membrane;

contacting the second side of said first membrane with an organic molybdenum selective solvent operating to produce the selective passage of molybdenum through said first membrane;

contacting the organic solvent which has been in contact with the second side of said first porous membrane with the first side of a second, porous membrane;

contacting the second side of said second membrane with an alkaline solution for the selective passage of molybdenum through said second membrane;

recirculating said solvent solution which has been in contact with said first side of said second membrane, through an aqueous separator, and thence to the second side of said first membrane.

4,443,415

RECOVERY OF V_2O_5 AND NICKEL VALUES FROM PETROLEUM COKE

Paul B. Queneau, Golden; Robert F. Hogsett; Leo W. Beckstead, both of Arvada, and Dale K. Huggins, Golden, all of Colo., assignors to Amax Inc., Greenwich, Conn.

Filed Jun. 22, 1982, Ser. No. 391,027
Int. Cl.³ C01G 31/00, 53/00
U.S. Cl. 423—68 **8 Claims**

1. A process for recovering vanadium and nickel values from petroleum coke comprising carbonaceous matter assaying at least about 50 wt. % carbon and also containing vanadium, at least a portion of which is in an oxidation state no higher than trivalent, iron, in an amount less than about 10% by weight of the vanadium as V_2O_5, and nickel values, as well as one or more compounds of sulfur, comprising

(a) establishing a slurry of the coke in an aqueous solution of sodium carbonate in an amount to provide an excess of sodium over the stoichiometric amount for formation of $NaVO_3$ and Na_2SO_4,

(b) digesting the slurry in an autoclave at a digestion temperature of about 250° C. to about 320° C. under an oxygen overpressure comprising at least the stoichiometric amount of oxygen for oxidation of the vanadium in the trivalent or lower oxidation state to the pentavalent state, to form an aqueous sodium vanadate liquor containing at least about 75% of the vanadium values fed in the slurry and a digestion residue containing vanadium, iron, and nickel values as well as any unoxidized carbonaceous matter,

(c) separating the sodium vanadate liquor from the digestion residue,

(d) leaching the digestion residue with an aqueous solution of an alkali metal compound selected from the group consisting of carbonates and hydroxides to produce a vanadate leach liquor and a first leach residue,

(e) filtering the vanadate leach liquor from the first leach residue,

(f) leaching the first leach residue with an aqueous solution of a mineral acid having a pH value between about 3 and about 6 to produce a nickel leach liquor and a second leach residue, and

(g) filtering the nickel leach liquor from the second leach residue.

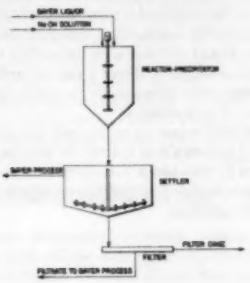
4,443,416

PURIFICATION OF BAYER PROCESS LIQUORS

Donald J. Donaldson, Orinda; Allan C. Kelly, Pleasanton; Joseph W. Mulloy, Orinda, and Donald R. Zwakenberg, Oakland, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Apr. 18, 1983, Ser. No. 485,807
Int. Cl.³ C01F 7/06
U.S. Cl. 423—122 **5 Claims**

1. A process for removing dissolved sodium oxalate impurity from oxalate-contaminated Bayer process liquors which comprises contacting the contaminated liquor with a caustic solution having an NaOH concentration in the range of about 400–730 grams/liter, at a temperature within the range of about 20° to about 85° C., the quantity of caustic solution being sufficient to provide a caustic concentration for the combined



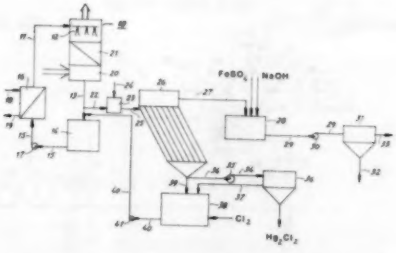
liquor-solution in excess of about 250 grams/liter calculated as Na_2CO_3 grams equivalent, maintaining the contact between the liquor and the caustic solution for a time period from about 35 to about 180 minutes to precipitate sodium oxalate, separating the precipitated sodium oxalate and recovering a liquor of significantly reduced oxalate impurity content.

4,443,417

METHOD FOR SEPARATING GASEOUS, ELEMENTARY MERCURY FROM A GAS

Johan E. Wiklund, Helsingborg, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Apr. 14, 1982, Ser. No. 368,210
Claims priority, application Sweden, May 8, 1981, 8102898
Int. Cl.³ B01D 53/34
U.S. Cl. 423—210 **8 Claims**



1. In a method for separating gaseous elementary mercury and gaseous halogenides of mercury and for other heavy metals from a gas in which the mercury-containing gas is treated with an aqueous washing solution circulating in a closed circuit and containing 0.1–300 mmol/l mercury (II) ions and at least twice that amount of ions capable of forming complexes with mercury (II) ions, and in which elementary mercury present in the gas is oxidized and absorbed in the washing liquid, wherein the improvement comprises saturating the gas having a temperature of 60°–70° C. with moisture, cooling the moisture saturated gas to form a condensate for absorbing gaseous halogenides from the gas, using the washing solution as gas-cooling medium and as a means for capturing condensate droplets formed as a result of said cooling, supplying the solution to the cooling stage in such an amount relative to the amount of gas entering said stage that the temperature of the solution is raised at most by about 20° C., controlling the temperature of the solution leaving said cooling stage to be below 60° C. and

maintaining the mercury (II) content of the washing solution by bringing said solution into contact with an oxidizing agent for mercury (I) ions.

4,443,418

METHOD OF REMOVING HYDROGEN SULFIDE AND CARBON DIOXIDE FROM GASES

Eugene F. Lutz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 337,232, Jan. 6, 1982, abandoned. This application Nov. 15, 1982, Ser. No. 441,830
Int. Cl.³ B01D 53/34
U.S. Cl. 423—226 14 Claims

5. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution comprising an effective amount of an oxidizing reactant selected from the group consisting of oxidizing polyvalent metal chelates of nitrilotriacetic acid, and mixtures thereof, to produce a sweet gas stream and an aqueous admixture containing sulfur and reduced reactant;

(b) removing aqueous admixture from the contacting zone, and removing solid sulfur from said aqueous admixture;

(c) regenerating said aqueous admixture, producing a regenerated oxidizing reactant solution, and returning regenerated oxidizing reactant solution to the contacting zone;

(d) removing a bleed stream containing a composition selected from polyvalent metal chelates of nitrilotriacetic acid, and mixtures thereof, and containing decomposition products of said composition, from one or more loci in steps a, b, or c;

(e) contacting said bleed stream with sufficient acid selected from the group consisting of HCl, H_2SO_4, H_3PO_4, and mixtures thereof, to dissociate at least the bulk of the polyvalent chelate or chelates in the bleed stream under conditions to precipitate a solid from the bleed stream containing nitrilotriacetic acid, and precipitating said solid and separating precipitated solid from the bleed stream.

4,443,419

MOVING BED GAS TREATING PROCESS

Don B. Carson, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sep. 9, 1982, Ser. No. 429,699
Int. Cl.³ B01J 8/00; C01B 17/00
U.S. Cl. 423—244 5 Claims

1. A process for treating gas streams for the simultaneous removal of sulfur dioxide nitrogen oxides and entrained particles which comprises the steps of:

(a) passing a feed gas stream and a reductant, which comprises undesired entrained particles, nitrogen oxides, and sulfur dioxide, horizontally through a vertical first contacting bed comprising a moving bed of treating particles and therein removing entrained particles comprising copper or copper containing compounds from the feed gas stream by the collection of entrained particles within the first contacting bed and also removing sulfur dioxide and nitrogen oxides from the feed gas stream by the chemical reaction of the sulfur dioxide with a component of copper or copper containing treating particles and the reduction of the nitrogen oxides within the first contacting bed, and thereby forming a first process stream which is substantially free of entrained particles and which has a lower concentration of sulfur dioxide and nitrogen oxides than the feed gas stream;

(b) monitoring the concentration of sulfur dioxide in the first process stream;

(c) adjusting the amount of the first process stream which is passed through a second contacting bed comprising treating particles comprising copper or copper containing compounds and the amount of the first process stream which is bypassed around the second contacting bed in response to the previously monitored concentration of sulfur dioxide in the first process stream; and,

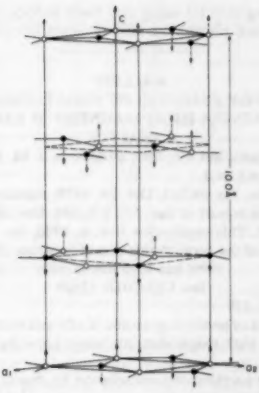
(d) transferring the treating particles comprising copper or copper containing compounds by the action of gravity from the second contacting bed to the first contacting bed.

4,443,420

PROCESS FOR PRODUCING CUBIC SYSTEM BORON NITRIDE

Tadao Sato; Toshihiko Ishii, both of Sakura, and Nobuo Setaka, Nagareyama, all of Japan, assignors to National Institute for Researches in Inorganic Materials, Nihari, Japan

Filed Mar. 17, 1982, Ser. No. 359,100
Claims priority, application Japan, Oct. 26, 1981, 56-171250
Int. Cl.³ C01B 21/06
U.S. Cl. 423—290 8 Claims



1. A process for producing cubic system boron nitride, which comprises applying a thermodynamically stable shock wave compressing pressure of from about 100 to 1500 k bar to rhombohedral system boron nitride to convert the rhombohedral system boron nitride to cubic system boron nitride

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4,443,421

PROCESS FOR REMOVING PARTICULATE IMPURITIES FROM AQUEOUS PHOSPHORIC ACID

Charles M. Hollifield, Lake City, and Teddy D. Smith, Jasper, both of Fla., assignors to Occidental Chemical Corporation, Houston, Tex.

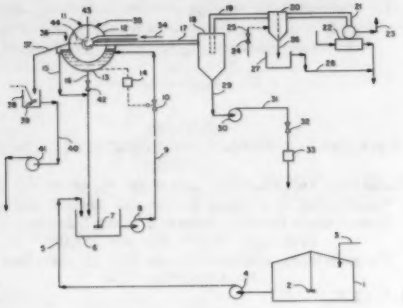
Filed Mar. 16, 1982, Ser. No. 358,744
Int. Cl.³ C01B 25/16
U.S. Cl. 423—321 R 23 Claims

1. A process for removing sludge-forming particulate impurities from aqueous phosphoric acid containing sludge-forming particulate impurities, said process comprising:

(a) passing an acid containing sludge-forming particulate impurities at an elevated temperature through a phosphoric acid resistant fabric filter supported on a porous medium to cause at least a portion of said particulate impurities in said acid to be filtered therefrom and to be retained by the fabric filter, thereby forming, directly on the surface of said fabric filter, a filter cake comprising said particulate impurities and entrained phosphoric acid;

(b) removing the filter cake from the fabric filter by the introduction of a discharge fluid to the fabric filter on the

side opposite said filter cake, thereby exposing a fresh surface of the fabric filter for subsequent filtration; and



(c) repeating step (a) using said fresh surface of said fabric filter as said phosphoric acid resistant fabric filter.

4,443,422

SYNTHESIS OF ZEOLITES OF SMALL AND UNIFORM SIZE HAVING A HIGH MAGNESIUM EXCHANGE CAPACITY

John A. Kostinko, Bel Air, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 88,243, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 971,584, Dec. 20, 1978, Pat. No. 4,235,852. This application Nov. 4, 1980, Ser. No. 203,925

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ C01B *33/28*

U.S. Cl. 423—329 **7 Claims**

1. A method of producing zeolite X of small and uniform size and having a high magnesium exchange capacity which comprises:

(a) forming a sodium silicate solution by dissolving sand in a sodium hydroxide solution at a pressure of at least 100 psig heated to a temperature of at least 130° C. to produce a sodium silicate solution having a silica to sodium oxide molar ratio of between 2.4:1 and 2.8:1;

(b) activating said sodium silicate solution by treating with from 50 to 2000 ppm alumina;

(c) heating said sodium silicate solution to between 40° and 120° C.;

(d) forming a sodium aluminate solution;

(e) mixing the sodium aluminate solution and the sodium silicate solution to produce a reaction mixture comprising a sodium silicate mother liquor and an amorphous sodium alumino silicate, in total having a water to sodium oxide molar ratio of between 25:1 and 90:1; a sodium oxide to silica molar ratio of between 1:1 and 3:1; and a silica to alumina molar ratio of between 5:1 and 10:1;

(f) heating said mixture;

(g) reacting said mixture until zeolite X is formed; and

(h) recovering said zeolite X.

4,443,423

METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES UTILIZING A POLYVALENT METAL CHELATE SOLUTION AND ELECTROLYTICALLY REGENERATING THE SOLUTION

Donald C. Olson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

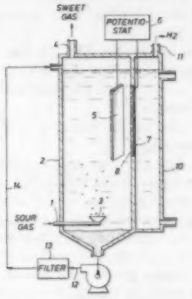
Filed Sep. 30, 1982, Ser. No. 430,465

Int. Cl.³ C01B *17/04*; B01D *53/34*

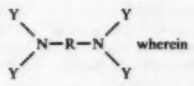
U.S. Cl. 423—573 G **7 Claims**

1. A process for the removal of H_2S from a sour gaseous stream comprising

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution containing an



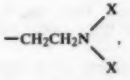
effective amount of a reactant comprising an oxidizing polyvalent metal chelate of an acid having the formula



wherein

from two to four of the groups Y are selected from acetic and propionic acid groups;

from zero to two of the groups Y are selected from 2-hydroxy ethyl, 2-hydroxy propyl, and



wherein X is selected from acetic acid and propionic acid groups; and

R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen atoms are in the 1,2 position; and mixtures thereof,

and producing a sweet gas stream and an aqueous admixture containing crystalline sulfur, hydrogen ions, and the reduced polyvalent metal chelate of said acid, or mixtures thereof; said contacting zone comprising an anode section of an electrochemical cell, said cell also comprising a separate cathode section containing a cathode connected through an external electrical convention to the anode, the anode section and the cathode section being separated by a hydrogen ion permeable barrier,

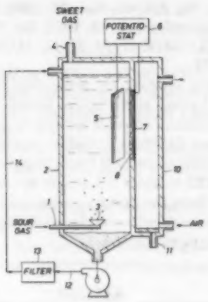
(b) oxidizing the reduced polyvalent metal chelate or chelates of said acid in the aqueous reaction solution at the anode by supplying direct current to said cell, concomitantly allowing hydrogen ions to migrate to the cathode, and producing hydrogen at the cathode;

(c) removing sulfur from the aqueous reaction solution, and hydrogen from the cathode section.

4,443,424
METHOD OF REMOVING HYDROGEN SULFIDE FROM GASES UTILIZING A POLYVALENT METAL CHELATE SOLUTION AND ELECTROLYTICALLY REGENERATING THE SOLUTION

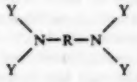
Donald C. Olson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sep. 30, 1982, Ser. No. 430,462
Int. Cl.³ C01B 17/04; B01D 53/34
U.S. Cl. 423—573 G 6 Claims



1. A process for the removal of H_2S from a sour gaseous stream comprising

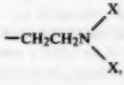
(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the solution containing an effective amount of an oxidizing reactant comprising an oxidizing polyvalent metal chelate of an acid having the formula



wherein

from two to four of the groups Y are selected from acetic and propionic acid groups;

from zero to two of the groups Y are selected from 2-hydroxy ethyl, 2-hydroxy propyl, and



wherein X is selected from acetic acid and propionic acid groups; and

R is ethylene, propylene or isopropylene or alternatively cyclohexane or benzene where the two hydrogen atoms replaced by nitrogen atoms are in the 1,2 position, and mixtures thereof;

and producing a sweet gas stream and an aqueous reaction solution containing crystalline sulfur, hydrogen ions, and reduced polyvalent metal chelate or chelates of said acid;

said contacting zone comprising an anode section of an electrochemical cell, said cell also comprising a separate cathode section containing a cathode connected through an external electrical connection to the anode, the anode section and the cathode section being separated by a hydrogen ion permeable barrier;

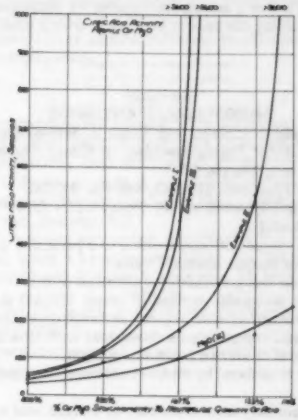
(b) oxidizing the reduced polyvalent metal chelate or chelates of said acid in the aqueous reaction solution at the anode by supplying direct current to said cell and allowing hydrogen ions to migrate to the cathode, concomitantly supplying oxygen to the cathode and forming water at the cathode;

(c) removing sulfur from the aqueous reaction solution, and water from the cathode section.

4,443,425
MAGNESIUM OXIDE COMPOSITION FOR COATING SILICON STEEL

Samuel W. Sopp, Foster City; Leonard S. Lee, South San Francisco, and Michael W. Howe, Albany, all of Calif., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 9, 1981, Ser. No. 328,965
Int. Cl.³ C01F 5/06
U.S. Cl. 423—635 5 Claims



1. A magnesium oxide composition, for use in coating silicon steel, having a Citric Acid Activity of 50 to 200 seconds and a particle size of 90 percent finer than 325 mesh, comprising a blend of

(a) ground magnesium oxide having a Citric Acid Activity of greater than 200 seconds and

(b) ground magnesium oxide having a Citric Acid Activity of 40 to 100 seconds.

4. A process for the production of a magnesium oxide composition, for use in coating silicon steel, having a Citric Acid Activity of 50 to 200 seconds and a particle size of 90 percent finer than 325 mesh, comprising:

(a) grinding to a 90 percent finer than 325 mesh

(i) 20 to 60 percent by weight of a ground magnesium oxide having a Citric Acid Activity of greater than 200 seconds and

(ii) 40 to 80 percent by weight of a ground magnesium oxide having a Citric Acid Activity of 40 to 100 seconds and

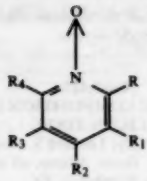
(b) blending (i) and (ii) together.

4,443,426
BLOOD AGENT

Madhukar L. Thakur, Hamden, Conn., assignor to Yale University, New Haven, Conn.

Filed Jun. 14, 1982, Ser. No. 387,731
Int. Cl.³ A61K 43/00, 49/00
U.S. Cl. 424—1.1 36 Claims

1. A process for imaging blood cells comprising intravenously injecting an effective amount of a composition containing the blood cells to be imaged which have been radioactively labelled by means of a complex of a radioactive metal selected from the group consisting of technetium, indium, ruthenium or gallium, with a compound of the formula:



I

wherein R is an electron denoting or an electron withdrawing group; and R_1, R_2, R_3 and R_4 and independently halogen, methoxy, ethoxy, hydrogen—$(CH_2)_n$—COOH, methyl or ethyl; and n is 0 or 1 in a carrier suitable for intravenous injection and scanning the area to be imaged with a scintiscanning means.

4,443,427

MONOCLONAL ANTIBODY

Ellis L. Reinherz, Lincoln, and Stuart F. Schlossman, Newton Centre, both of Mass., assignors to Sidney Farber Cancer Institute, Inc., Boston, Mass.

Filed Jun. 21, 1982, Ser. No. 390,548
Int. Cl.³ A61K *43/00, 39/00;* **C12N** *15/00*
U.S. Cl. 424—1.1 **8 Claims**

1. A monoclonal antibody specific to a particular antigen on the surface of mature human T cells,

said antigen being further characterized in that

it has a molecular weight of about 120,000 daltons, as determined by carrying out electrophoresis on the antigen and comparing its movement with that of marker proteins of known molecular weight,

it is not modulated by monoclonal antibodies specific to it, and

it appears only on the surfaces of mature, and not immature, T cells, and

said monoclonal antibody being further characterized in that

it is produced by a hybrid cell comprising a murine lymphocyte,

it is capable of selectively binding mature human T cells,

it lyses mature human T cells in vitro in the presence of complement, and

it fails to induce the proliferation or activation of human lymphocytes.

4,443,428

EXTENDED ACTION CONTROLLED RELEASE COMPOSITIONS

Benjamin Oshlack, New York, N.Y., and Stewart T. Leslie, Aberdeen, Scotland, assignors to Euroceltique, S.A., Luxembourg

Filed Jun. 21, 1982, Ser. No. 390,540
Int. Cl.³ A61K *9/22, 9/24, 9/52*
U.S. Cl. 424—22 **9 Claims**

1. On an extended action controlled release pharmaceutical composition for oral administration comprising a hydrated hydroxyalkylcellulose and hydrophobic 10 to 18 carbon atoms higher aliphatic alcohol or paraffin wax balanced matrix melt granulation pharmaceutically acceptable controlled release core or matrix for the oral administration of pharmaceutically active agents, said controlled release core or matrix providing upon oral ingestion thereof slow release in the body of pharmaceutically active agents distributed therein, the improvement wherein said composition comprises said controlled release core or matrix for oral administration having distributed therethrough a pharmaceutically effective amount of a pharmacologically active substance in salt form thereof and in the free base form thereof, said pharmaceutically effective amount comprising between about 75% and 25% by weight of a pharmaceutically acceptable salt form of said pharmacologically active substance and between about 25% and 75% by weight of the free base form of said pharmacologically active substance, the amounts being based on the pharmacologically active moiety of said pharmacologically active substance.

4,443,429

CONTACT LENS DISINFECTING AND PRESERVING SOLUTION (POLYMERIC)

Francis X. Smith, and Thomas M. Riedhammer, both of Rochester, N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Division of Ser. No. 210,960, Nov. 28, 1980, Pat. No. 4,361,548.
This application Sep. 15, 1982, Ser. No. 418,351
Int. Cl.³ A61K *31/74, 31/14, 31/305, 31/19*
U.S. Cl. 424—78 **4 Claims**

1. An aqueous solution for preserving or disinfecting soft contact lenses having as the active antimicrobial agent dimethyldiallyl ammonium chloride homopolymer having a molecular weight from 10,000 to 1,000,000 present in the amount of from about 0.00001 to about 0.1 weight percent combined with from about 0.0001 to about 0.5 weight percent of an enhancing agent selected from the group consisting of thimerosal, sorbic acid, phenylmercuric salts, ethylenediaminetetracetic acid and its salts and mixtures thereof.

4,443,430

SYNTHETIC ABSORBABLE HEMOSTATIC AGENT

Frank V. Mattei, Piscataway, N.J., and Namassivaya Doddi, Upland, Calif., assignors to Ethicon, Inc., Somerville, N.J.

Filed Nov. 16, 1982, Ser. No. 442,218
Int. Cl.³ A61K *31/74;* **C08G** *63/08*
U.S. Cl. 424—78 **16 Claims**

1. A synthetic absorbable hemostatic agent for use in the control of osseous hemorrhage, comprising a copolymer of lactide and glycolide containing from about 30% to 70% lactide on a molar basis, having a molecular weight such that it is workable and softenable by hand to bring about a putty-like consistency at room temperature, the agent having a tackiness sufficient for it to adhere readily to a bloody bone surface and yet being able to be manipulated without crumbling or sticking to the surgeon's gloves, said copolymer having an inherent viscosity in hexafluoroisopropanol at a concentration of 0.1 g/dl and at a temperature of 25° C. of between about 0.03 and 0.1.

14. A process for the control of bleeding from cut bone surfaces, which comprises applying to the cut bone surface, a copolymer of lactide and glycolide containing from 30% to 70% lactide on a molar basis, having a molecular weight such that it is workable and softenable by hand to bring about a putty-like consistency at room temperature, the agent having a tackiness sufficient for it to adhere readily to a bloody bone surface and yet being able to be manipulated without crumbling or sticking to the surgeon's gloves, said copolymer having an inherent viscosity in hexafluoroisopropanol at a concentration of 0.1 g/dl and at a temperature of 25° C. of between about 0.03 and 0.1.

4,443,431

NEISSERIA GONORRHOEAE VACCINE

Thomas M. Buchanan, Seattle, Wash.; William Pearce, Arlington, Va., and Kirk C. S. Chen, Seattle, Wash., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 27, 1981, Ser. No. 267,538
Int. Cl.³ A61K *39/095;* **C07C** *103/52*
U.S. Cl. 424—92 **14 Claims**

1. A cleaved fragment of purified pili protein from *Neisseria gonorrhoeae* comprising a CN1 fragment which is the largest fragment obtained by cleavage of the purified pili protein at the methionine residues thereof, said fragment being further characterized by:

(a) an amino acid sequence different from the amino acid sequences of the other fragments;
(b) containing an antigen common to most pili of *Neisseria gonorrhoeae;* and
(c) being the only fragment obtained capable of binding to cells.

3. A vaccine for protecting animals against *Neisseria gonorrhoeae* infection consisting essentially of an effective amount of the cleaved fragment of claim 1 admixed with a pharmaceutically acceptable carrier.

4,443,432

OPHTHMALIC IRRIGATING SOLUTION

Michael E. Garabedian, Arlington, and Robert E. Roehrs, Fort Worth, both of Tex., assignors to Alcon Laboratories, Inc., Forth Worth, Tex.

Filed Oct. 5, 1981, Ser. No. 308,386
Int. Cl.³ A61K *33/00, 33/14, 33/06, 33/10*
U.S. Cl. 424—127 **17 Claims**

1. A method of maintaining corneal stability during ocular surgery comprising
preparing a stable basic solution containing bicarbonate ions,
sterilizing said basic solution and prepackaging said basic solution,
preparing a stable acidic solution containing calcium ions, magnesium ions, dextrose and glutathione,
sterilizing said acidic solution and prepackaging said acidic solution,
providing sodium ions in one of said solutions, providing potassium ions in one of said solutions and providing chloride ions in one of said solutions,
mixing said prepackaged solutions together in a manner which maintains their sterility to form a combined solution containing between about 130 and about 180 mM/l sodium ions, between about 3 and about 10 mM/l potassium ions, between about 1 and about 5 mM/l calcium ions, between about 0.5 and about 4 mM/l magnesium ions, between about 10 and about 50 mM/l bicarbonate ions, between about 2 and about 10 mM/l dextrose and between about 0.03 and about 0.5 mM/l oxidized glutathione or the equivalent amount of reduced glutathione, said combined solution having a pH of between about 6.8 and about 8.0 and an osmolality of between 250 and about 350 mOsm/kg, and
within about 24 hours of mixing said prepackaged solutions, irrigating an eye with said combined solution.

4,443,433

ANTACID MATERIAL BASED ON MAGNESIUM ALUMINUM HYDROXIDE AND PREPARATION THEREOF

Adolph Knecht; Michael Schneider, both of Freiburg, and Walter Ambrosch, Emmendingen, all of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 1, 1982, Ser. No. 438,104
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145163
Int. Cl.³ A61K *33/08;* **C01D** *5/10*
U.S. Cl. 424—157 **5 Claims**

1. A process for the preparation of an antacid material based upon magnesium aluminium hydroxide, wherein magnesium hydroxide and/or magnesium oxide is reacted in an atomic ratio of magnesium to aluminium of 1:1 to 3:1 with an aqueous solution of aluminium sulphate until the pH of the reaction mixture is from 4.0 to 8.0 whereafter water-soluble components are removed from the mixture by centrifugation or filtration and the isolated mixture, if desired, dried.

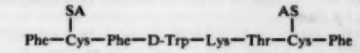
4,443,434

ANTIULCER AGENT

Eric L. Lien, Paoli, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 18, 1982, Ser. No. 409,255
Int. Cl.³ A61K *37/00*
U.S. Cl. 424—177 **3 Claims**

1. A method for treating peptic ulcer disease which comprises administering to a mammal in need thereof an octapeptide of the formula:



in which the A groups are hydrogen or a direct bond between the two sulfur atoms, or a pharmaceutically acceptable salt or amide thereof, in an amount sufficient to alleviate the symptoms of a peptic ulcer.

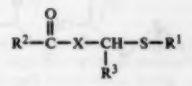
4,443,435

PRODRUGS OF 6-MERCAPTOPURINE AND 6-MERCAPTOPURINE RIBOSIDES AND THERAPEUTIC COMPOSITIONS AND METHODS EMPLOYING THEM

Nicholas S. Bodor; Kenneth B. Sloan, both of Gainesville, Fla., and Stefano A. Pogany, Lawrence, Kans., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 290,625, Aug. 3, 1981, abandoned, which is a continuation of Ser. No. 141,981, Apr. 21, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,264
Int. Cl.³ A61K *31/52, 31/70;* **C07D** *473/24*
U.S. Cl. 424—180 **12 Claims**

1. A compound selected from the group consisting of those having (i) the structural formula I:



wherein
X is O, S or NR^5;
R^1S is the deprotonated residue of a biologically active agent R^1SH which is a thiopurine derivative selected from the group consisting of 6-mercaptopurine and a sugar and/or an acetate derivative thereof selected from a group consisting of 6-mercaptopurineriboside and 9-β-D-ribofuranosyl-6-thio-9H-purine-2',3',5'-triacetate;
R^2 is
(a) straight or branched chain alkyl having from 1 to 20 carbon atoms;
(b) aryl having from 6 to 10 carbon atoms;
(c) cycloalkyl having from 3 to 8 carbon atoms;
(d) alkenyl having from 2–6 carbon atoms;
(e) cycloalkenyl having from 5 to 8 carbon atoms;
(f) carboxyalkyl or alkanoyloxyalkyl having from 2–6 carbon atoms;
R^3 is
(a) hydrogen;
(b) R^2;
(c) lower alkanoyl having from 2–6 carbon atoms; or
(d) halologweralkyl having from 1–6 carbon atoms;
R^5 is hydrogen or lower alkyl having 1–6 carbon atoms;
(ii) prodrugs having the structural formula (I) wherein

is the residue of a naturally occurring protein amino acid, the residue of a N-substituted naturally occurring amino acid,

which N-substituent is C_{1-6} alkyl or an amino acid protective group cleavable via hydrogenolysis or hydrolysis selected from the group consisting of formyl, benzyloxy, carbonyl, and t-butyloxycarbonyl, or the residue of an N,N-lowerdialkyl or C_4–C_7 cycloalkylamino acids; and

(iii) a non-toxic, pharmaceutically acceptable salt thereof.

11. A therapeutically effective composition of matter comprising an effective amount of a compound as defined by claim **1**, and a pharmaceutically effective carrier therefor.

12. The method of eliciting the corresponding therapeutic response in a warm-blooded animal, which comprises administering to such animal an effective amount of a compound as defined by claim **1**.

4,443,436

C-20-MODIFIED MACROLIDE DERIVATIVES OF THE MACROLIDE ANTIBIOTICS TYLOSIN, DESMYCOSIN, MACROCIN, AND LACTENOCIN

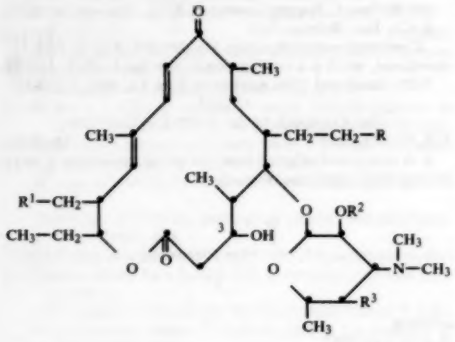
Herbert A. Kirst, and John E. Toth, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 13, 1982, Ser. No. 417,248

Int. Cl.[3] **A61K** *31/71*; **C07H** *17/08*

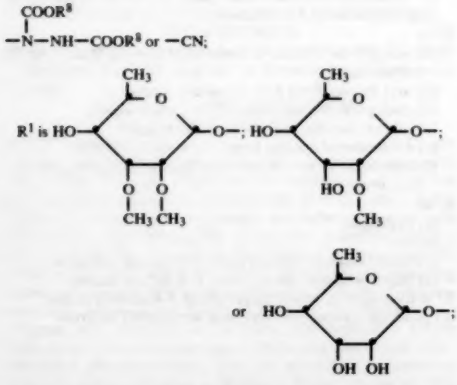
U.S. Cl. 424—180 **143 Claims**

1. A compound of the formula



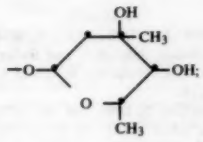
wherein

R is chloro, fluoro, —OR^4, —SR^5, —SO_2R^6, azido, —NHR^7, —N—phthalimido,



R^2 is hydrogen; C_1–C_5-alkanoyl; C_1–C_5-alkanoyl having from one to three halo substituents; benzoyl, phenylacetyl or phenylpropionyl; or benzoyl, phenylacetyl or phenylpropionyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups;

R^3 is hydroxy; C_1–C_5-alkanoyloxy; C_1–C_5-alkanoyloxy having from one to three halo substituents; benzoyloxy, phenylacetoxy or phenoxyacetoxy; benzoyloxy, phenylacetoxy or phenoxyacetoxy having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; or



R^4 is C_1–C_4-alkyl; C_1–C_4-alkyl having one or more fluoro or chloro substituents; cyclohexyl; benzyl, phenethyl or phenoxyethyl; benzyl, phenethyl or phenoxyethyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; phenyl; derivatized phenyl; naphthyl; a heteroaryl group selected from pyridinyl, pyrimidinyl, pyridazinyl, pyrazinyl, triazinyl, indolyl, isoquinolinyl, quinolinyl, quinazolinyl, cinnolinyl, quinoxalinyl, phthalazinyl, benzotriazolyl, benzoxazolyl, benzimidazolyl, carbazolyl, or acridinyl; a selected heteroaryl group having at least one substituent selected from C_1–C_4-alkyl, halo, methoxy, ethoxy, hydroxy, oxo or phenyl; C_1–C_5-alkanoyl; C_1–C_5-alkanoyl having from one to three halo substituents; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl or phenylthioacetyl; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl or phenylthioacetyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; methanesulfonyl; trifluoromethanesulfonyl; phenylsulfinyl or phenylsulfonyl; phenylsulfinyl or phenylsulfonyl having on the phenyl ring from one to five halo or from one to two nitro groups; cinoxacinyl or —NO_2;

R^5 is C_1–C_4-alkyl; C_1–C_4-alkyl having one or more fluoro or chloro substituents; cyclohexyl; phenyl, benzyl or phenethyl; phenyl, benzyl or phenethyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; a heteroaryl group selected from imidazolyl, pyrazolyl, pyridinyl, pyrimidinyl, pyrazinyl, pyridazinyl, triazinyl, triazolyl, tetrazolyl, oxazolyl, isoxazolyl, oxadiazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thienyl and furanyl; or a selected heteroaryl group having at least one substituent selected from C_1–C_4-alkyl, halo, methoxy, ethoxy, hydroxy, oxo or phenyl;

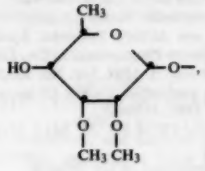
R^6 is C_1–C_4-alkyl; C_1–C_4-alkyl having one or more fluoro or chloro substituents; phenyl; or phenyl having from one to five halo or methyl or from one to two methoxyl, nitro or hydroxyl substituents;

R^7 is hydrogen; C_1–C_5-alkanoyl; C_1–C_5 alkanoyl having from one to three halo substituents; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl or phenylthioacetyl; benzoyl, phenylacetyl, phenylpropionyl, phenoxyacetyl, or phenylthioacetyl having on the phenyl ring from one to five halo or methyl groups or from one to two methoxyl, nitro or hydroxyl groups; or alkoxycarbonyl;

R^8 is methyl or ethyl; and

halo is chloro, bromo or fluoro;

provided that, when R^7 is hydrogen, R^2 must be hydrogen and R^3 must be hydroxy; and that, when R^1 is



R cannot be chloro or fluoro; and its acid addition salts.

128. A composition useful for the treatment of susceptible bacterial or mycoplasmal infections comprising a compound of claim **1** wherein the acid addition salt is a pharmaceutically acceptable one and a suitable vehicle.

4,443,437

VETERINARY COMPOSITION AND METHOD OF USING SAME

Walter G. Prokosch, and Robert L. Marshall, both of Rte. 2, P.O. Box 65, Honey Grove, Tex. 75446

Filed Sep. 23, 1982, Ser. No. 422,363
Int. Cl.³ A61K *35/78*
U.S. Cl. 424—195 **10 Claims**

1. A mehtod of treating wounds, lacerations or surface fistulas in animals to promote the healing thereof, which comprises topically applying an effective amount of tall oil to the affected area for promoting healing thereof.

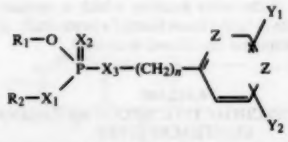
4,443,438

INSECTICIDAL AND/OR ACARICIDAL COMPOSITION EXHIBITING LOW TOXICITY TO MAMMALS AND FISH

Kiyoshi Kasamatsu, Takarazuka; Masachika Hirano, Ibaraki, and Takeshi Okuno, Tokyo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 99,482, Dec. 3, 1979, Pat. No. 4,357,348.
This application Aug. 6, 1982, Ser. No. 406,014
Claims priority, application Japan, Dec. 8, 1978, 53-152289; Dec. 8, 1978, 53-152290
Int. Cl.³ A01N *57/00, 37/34, 57/26*
U.S. Cl. 424—200 **8 Claims**

1. An insecticidal or acaricidal composition comprising an inert pesticide carrier and, as an active ingredient, an insecticidally or acaricidally effective amount of a mixture comprising (I) m-(p-bromophenoxy)-α-cyanobenzyl trans- or trans-cis-2,2-dimethyl-3-(2,2-dichlorovinyl)cyclopropanecarboxylate wherein the trans/cis ratio is not less than 25/75, and an organophosphate of the general formula (II),



(II)

wherein each of R_1 and R_2 is a C_1–C_3 alkyl group, each of X_1, X_2 and X_3 is an oxygen or sulfur atom, each of Y_1 and Y_2 is the same or different C_1–C_3 alkyl, methylmercapto, cyano or nitro group, or a halogen atom, Z is a carbon or nitrogen atom and n is 0 or 1, wherein the mixing ratio of the compound (I) to the compound (II) is within a range of from 1:1 to 1:100 by weight.

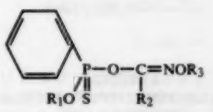
4,443,439

PESTICIDAL PHENYLTHIONOPHOSPHONIC ACID ESTERS

Hiromichi Ishikawa; Kazuhiko Kitaori, both of Atsugi; Satoru Moriyama, Hatano; Tadashi Chono, and Tsugio Uchiyama, both of Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1982, Ser. No. 412,004
Claims priority, application Japan, Sep. 4, 1981, 56-138322
Int. Cl.³ A01N *57/14, 57/22;* **C07F** *9/40*
U.S. Cl. 424—211 **8 Claims**

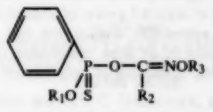
1. A method of combating insect pests, acarine pests and/or nematode pests at a locus of infestation, which comprises treating the pests or the locus of infestation with an insecticidally, miticidally and/or nematocidally effective amount of a compound of the general formula:



(I)

wherein R_1 denotes a lower alkyl group; R_2 denotes a hydrogen atom, a lower alkyl group or an unsaturated lower alkyl group; and R_3 denotes a lower alkyl group or an unsaturated lower alkyl group.

3. Compounds of the general formula:



(I)

wherein R_1 denotes a lower alkyl group; R_2 denotes a hydrogen atom, a lower alkyl group or an unsaturated lower alkyl group; and R_3 denotes a lower alkyl group or an unsaturated lower alkyl group.

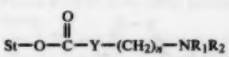
4,443,440

AMINE CONTAINING ESTER PRODRUGS OF CORTICOSTEROIDS

Bradley D. Anderson, Kalamazoo, and Robert A. Conradi, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 30, 1982, Ser. No. 412,426
Int. Cl.³ C07J *1/100;* **A61K** *31/58*
U.S. Cl. 424—243 **12 Claims**

1. A compound of the formula



wherein

St is a corticosteroid absent the C-21 hydroxyl of said corticosteroid;

Y is a bond, —O— or —S—;

n is an integer of form 4 to 9;

each of R_1 and R_2 is a lower alkyl group of from 1 to 4 carbon atoms optionally substituted with one hydroxyl group, or R_1 and R_2 taken together with the nitrogen atom to which each is attached forms a monocyclic heterocyclic ring selected from pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, or N-(lower)alkyl piperazino; pharmaceutically acceptable addition salts and quaternary ammonium salts thereof.

9. A pharmaceutical composition comprising an effective quantity of a compound of claim **1** as a sterile aqueous solution.

4,443,441

FIXATION OF INTRAOCULAR LENSES

Miles A. Galin, 113 E. 39th St., New York, N.Y. 10016

Filed Aug. 7, 1981, Ser. No. 290,854

Int. Cl.³ A61K *31/33, 31/415, 31/22, 31/135*

U.S. Cl. 424—244 **5 Claims**

1. A process for aiding the stabilizing or repositioning of a surgically implanted intraocular lens in the correct position in an eye, characterized by instilling into the eye having the surgically implanted intraocular lens an approximately one drop dose of an ophthalmic solution containing an α-adrenergic blocking agent selected from the group consisting of thymoxamine, phentolamine, azepetine, phenoxybenzamine, clonidine and totazoline in a concentration of from about 0.1% to about 1% by weight.

4,443,442

METHOD AND COMPOSITION FOR TREATMENT OF ACNE VULGARIS

Scott D. Skillern, 722 E. Colfax St., South Bend, Ind. 46617

Filed Dec. 21, 1979, Ser. No. 106,224

Int. Cl.³ A61K *31/54*

U.S. Cl. 424—246 **5 Claims**

1. A method for the treatment of acne vulgaris in a human having acne vulgaris which comprises conjointly administering an acne controlling compound induced side effect reducing amount comprising at least 0.2 grams of sodium in a form of a pharmacologically acceptable sodium salt and a therapeutically effective amount of an acne controlling compound selected from the group consisting of polythiazide and trichlormethiazide.

4,443,443

CEPHEM COMPOUNDS

Ikuo Ueda; Masaaki Matsuo, both of Toyonaka; Kiyoshi Tsuji, Osaka, and Masayuki Kato, Mino, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

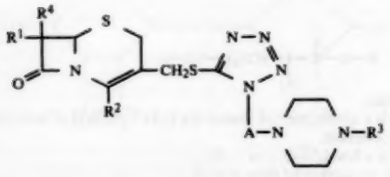
Filed Dec. 5, 1980, Ser. No. 213,232

Claims priority, application Japan, Dec. 17, 1979, 54-7943363

Int. Cl.³ C07D *501/36;* **A61K** *31/545*

U.S. Cl. 424—246 **20 Claims**

1. A cephem compound of the formula:



wherein

R^1 is amino or a protected amino group;

R^2 is carboxy or a protected carboxy group;

A is lower alkylene which may have an oxo group;

R^3 is carboxy, a protected carboxy group, lower alkyl, lower alkenyl, hydroxy(lower)alkyl, phenyl(lower)alkyl, phenyl, tolyl, xylyl, cumenyl, or naphthyl; and

R^4 is hydrogen or lower alkoxy, and pharmaceutically acceptable salts thereof.

4,443,444

CEPHEM COMPOUNDS

Takao Takaya, Kawanishi; Hisashi Takasugi, Osaka; Masayoshi Murata, Mino, and Akiteru Yoshioka, Kyoto, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

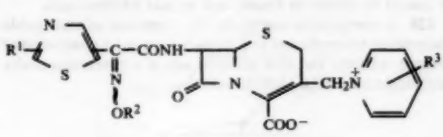
Filed Aug. 3, 1981, Ser. No. 289,503

Claims priority, application United Kingdom, Aug. 11, 1980, 8026112; Jan. 12, 1981, 8100848

Int. Cl.³ C07D *501/38;* **A61K** *31/545*

U.S. Cl. 424—246 **14 Claims**

1. A cephem compound of the formula:



wherein

R^1 is amino or a protected amino group;

R^2 is lower alkenyl, lower alkynyl, unsubstituted cycloalkyl, phenyl(lower)alkyl, phenyl(lower)alkyl, substituted with halogen, or lower alkylthio(lower)alkyl; and

R^3 is hydrogen, carbamoyl or hydroxy(lower)alkyl, and pharmaceutically acceptable salts thereof.

4,443,445

IMIDAZO- AND PYRIMIDO-1,3,5-THIADIAZIN-4-ONES

Saleem Farooq, Arisdorf, and Hans-Peter Streibert, Rheinfelden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

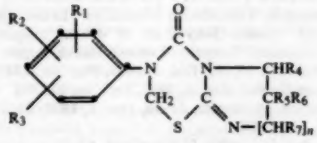
Filed Sep. 1, 1982, Ser. No. 413,955

Claims priority, application Switzerland, Sep. 10, 1981, 5859/81; Dec. 10, 1981, 7896/81; Aug. 9, 1982, 4771/82

Int. Cl.³ C07D *513/04;* **A01N** *43/50, 43/54, 43/88*

U.S. Cl. 424—246 **19 Claims**

1. A compound of the formula I



wherein each of R_1, R_2 and R_3 independently of one another is hydrogen, halogen, C_1–C_4alkyl, trifluoromethyl, C_1–C_4-alkoxy, nitro, benzyl, phenyl, phenoxy, phenylthio, or phenoxy which is substituted by one or two members selected from the group consisting of halogen C_1–C_4alkyl, trifluoromethyl, nitro, methoxy and ethoxy; each of R_4, R_5, R_6 and R_7 independently of one another is hydrogen or C_1–C_4alkyl; and n is 0 or 1, or a salt thereof.

17. A method of controlling plant destructive insects and representatives of the order Acarina, which comprises applying to said insects or to the locus thereof a pesticidally effective amount of a compound as claimed in claim 1.

4,443,446

USE OF PSYCHOACTIVE DRUGS AS VAGINAL CONTRACEPTIVES

Milton J. Cormier, Bogart, Ga., assignor to University of Georgia Research Foundation, Inc., Athens, Ga.

Filed May 30, 1980, Ser. No. 155,800

Int. Cl.³ A61K *31/38, 31/54, 31/445*

U.S. Cl. 424—247 **10 Claims**

1. A method for preventing conception in a female which comprises: introducing an effective amount of a calmodulin

binding psychoactive drug selected from the group consisting of penfluridol, pimozide, trifluoperazine, chlorpromazine, benperidol, haloperidol, and clozapine into the vagina of the female.

4,443,447

PHENYL-SUBSTITUTED TRICYCLIC ANTIBACTERIAL AGENTS

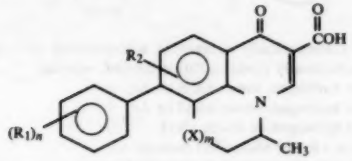
John F. Gerster, Woodbury, and Richard M. Stern, Cottage Grove, both of Minn., assignors to Riker Laboratories, Inc., St. Paul, Minn.

Filed Oct. 25, 1982, Ser. No. 436,376

Int. Cl.³ A61K *31/47;* **C07D** *455/04, 498/16*

U.S. Cl. 424—248.53 **11 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of a —O—, —CH_2— and

m is 0 or 1; R_1 is selected from the group consisting of hydrogen, nitro, amino, lower alkyl, lower alkanamido, lower N,N-dialkylamino, formamido, hydroxy, alkoxy, halogen, lower haloalkanamido and pyrryl; n is 1 or 2; and R_2 is selected from the group consisting of hydrogen, methyl, fluoro, chloro and nitro; or a derivative thereof selected from the group consisting of an acyl chloride, ester, alkylaminoalkyl ester salt, amido, and a pharmaceutically acceptable carboxylate salt.

10. A method of inhibiting the growth of microorganisms, comprising contacting said microorganisms with an effective amount of a compound according to claim **1**.

4,443,448

INDANE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHOD OF PREPARATION

Klaus P. Bogeso, Lyngby, Denmark, assignor to Kefalas A/S, Copenhagen-Valby, Denmark

Filed Feb. 26, 1981, Ser. No. 238,442

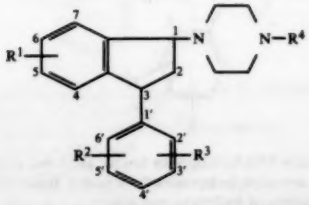
Claims priority, application United Kingdom, Feb. 29, 1980, 8006931

Int. Cl.³ C07D *241/04;* **A61K** *31/495*

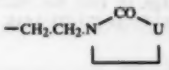
U.S. Cl. 424—250 **32 Claims**

1. A compound selected from the group consisting of a 1-piperazino-3-phenylindane of the formula:

I



wherein R^1 is selected from the group consisting of hydrogen, halogen, an alkyl group having one to four carbon atoms inclusive, an alkyloxy group having one to four carbon atoms inclusive, an alkylmercapto group having one to four carbon atoms inclusive, an amino group, an acetamino group, a cyano group, a trifluoromethyl group and an alkylsulfonyl group having one to four carbon atoms inclusive; R^2 and R^3 are each selected from hydrogen, halogen, alkyl and trifluoromethyl; and R^4 is selected from an alkyl and alkenyl group, branched or unbranched, having one to six carbon atoms inclusive optionally substituted with one or two hydroxyl groups, a cyano group, an acetamino group, a cycloalkyl group having three to six carbon atoms in the ring, a phenyl group optionally substituted with a halogen atom, a hydroxy-substituted cyclohexyl group, a group



wherein U is >O or >NH, and a group —$(CH_2)_n$.CO.-phenyl wherein "n" is an integer of one to four inclusive, and the phenyl group may be optionally substituted with a halogen atom, any hydroxy group present in the indane of Formula I being optionally esterified with an aliphatic carboxylic acid having two to twenty-four carbon atoms inclusive, at least one of both R^1, R^2 or R^2, R^3 always being other than hydrogen, and

(2) a pharmaceutically-acceptable acid addition salt thereof.

4,443,449

ARYLCYCLOBUTYLALKYLAMINES AND ANTI-DEPRESSION COMPOSITION AND METHODS USING SAME

James E. Jeffery, and Eric C. Wilmshurst, both of Nottingham, England, assignors to The Boots Company Limited, Nottingham, England

Filed Apr. 5, 1982, Ser. No. 365,287

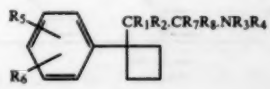
Claims priority, application United Kingdom, Apr. 6, 1981, 8110710

Int. Cl.³ A61K *31/135;* **C07C** *87/28*

U.S. Cl. 424—250 **32 Claims**

1. A compound of the formula I

I



in which R_1 is H or an alkyl group containing 1 to 3 carbon atoms;

in which R_2 is H or an alkyl group containing 1 to 3 carbon atoms;

in which R_3 and R_4, which are the same or different, are selected from the group consisting of H, a straight or branched chain alkyl group containing 1 to 4 carbon atoms, and a cycloalkyl group in which the ring contains 3 to 7 carbon atoms,

or R_3 and R_4 together with the nitrogen atom to which they are attached form a heterocyclic ring selected from the group consisting of pyrrolidinyl, piperidinyl and piperazinyl, each optionally substituted by one or more methyl groups, and 1, 2, 3, 6-tetrahydropyridyl;

in which R_5 and R_6 which are the same or different are selected from the group consisting of H, halo, an alkyl group containing 1 to 3 carbon atoms, and trifluoromethyl (with the proviso that one of R_5 and R_6 is halo), or R_5 and R_6, together with the carbon atoms to which they are attached, form a second benzene ring;

and in which R_7 and R_8 which are the same or different are

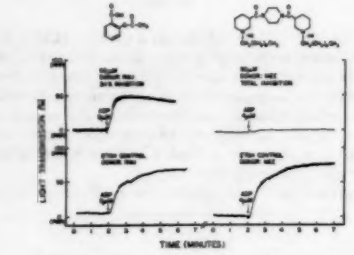
H or an alkyl group containing 1 to 3 carbon atoms; and pharmaceutically-acceptable salts thereof.

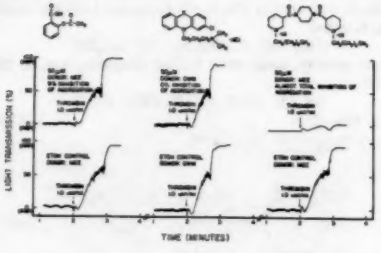
4,443,450

PLATELET AGGREGATION INHIBITORY AGENTS AND INTERMEDIATES THEREFOR

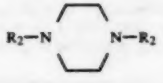
Andrew Lassio, Memphis; Ronald P. Quintana, Germantown; Marion Dugdale, and Randy W. Johnson, both of Memphis, all of Tenn., assignors to Research Corporation, Tucson, Ariz.

Filed Apr. 15, 1982, Ser. No. 368,863
Int. Cl.³ C07D *401/00*; A61K *31/495*
U.S. Cl. 424—250 **3 Claims**

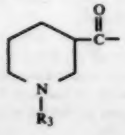




1. A compound having the structural formula:



Wherein R_2 is



and R_3 is alkyl or H.

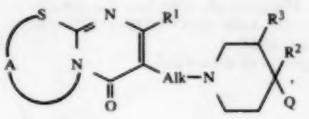
4,443,451

BICYCLIC PYRIMIDIN-5-ONE DERIVATIVES

Ludo E. J. Kennis, and Josephus C. Mertens, both of Turnhout, Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 283,590, Jul. 15, 1981, abandoned. This application Apr. 21, 1982, Ser. No. 370,653
Int. Cl.³ C07D *513/14, 513/22*; A61K *31/505*
U.S. Cl. 424—251 **18 Claims**

1. A chemical compound having the formula


(I)

the pharmaceutically acceptable acid-addition salts and the stereochemically isomeric forms thereof, wherein:

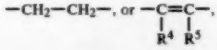
R^1 is hydrogen, lower alkyl or Ar;

R^2 is hydrogen, lower alkyl or Ar;

R^3 is hydrogen or lower alkyl;

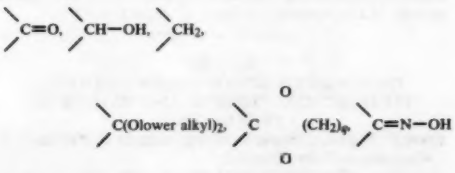
Alk is a lower alkanediyl radical;

A is a bivalent radical having the formula



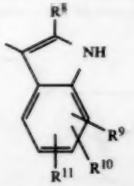
having the carbon atom attached to the S-atom, wherein R^4, R^5 and R^6 are each independently selected from the group consisting of hydrogen and lower alkyl and wherein R^4 and R^5 may also complete a saturated or unsaturated 5- or 6-membered carbocyclic ring, optionally substituted with a lower alkyl radical; and

Q is a member selected from the group consisting of a radical having the formula —X—Ar (a) wherein X is a member selected from the group consisting of



said R^7 being hydrogen or lower alkyl and said q being the integer 2 or 3; and

a radical having the formula


(b)

wherein R^8 is hydrogen or loweer alkyl and R^9, R^{10} and R^{11} are each independently selected from the group consisting of hydrogen and halo;

wherein Ar is phenyl or substituted phenyl, said substituted phenyl bearing an amino group and/or 1,2 or 3 halo atoms.

4,443,452
DIBENZODIAZEPINONES, PHARMACEUTICAL COMPOSITIONS THEREOF AND METHOD OF USE THEREOF

Wolfhard Engel, Biberach; Günter Trummlitz, Warthausen; Günther Schmidt; Wolfgang Eberlein, both of Biberach, all of Fed. Rep. of Germany; Rudolf Hammer, Milan, and Piero del Soldato, Monza, both of Italy, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

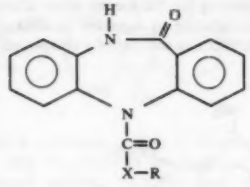
Filed Jan. 31, 1983, Ser. No. 462,378

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204158

Int. Cl.³ A61K *31/55;* **C07D** *403/12, 403/14*

U.S. Cl. 424—256 **4 Claims**

1. A compound of the formula



(I)

wherein

X is oxygen, —NH—, or —NCH_3— and

R is 1-methyl-4-piperidinyl, 4-methyl-1-piperazinyl, endo-8-methyl-8-azabicyclo[3.2.1]oct-3-yl, or exo-8-methyl-8-azabicyclo[3.2.1]oct-3-yl, each of which may optionally have an additional methyl substituent,

a diastereomer or enantiomer thereof, or a non-toxic, pharmacologically acceptable acid addition salt thereof with an inorganic or organic acid.

4. The method of inhibiting the formation of gastric ulcers in a warm-blooded animal in need thereof, which comprises perorally, parenterally, or rectally administering to said animal an effective anti-ulcerogenic amount of a compound of claim 1.

4,443,453
QUINOLINE DERIVATIVES, PHARMACEUTICAL COMPOSITIONS CONTAINING SUCH COMPOUNDS, AND METHODS FOR TREATING CARDIOVASCULAR CONDITIONS WITH THEM

Hans B. Trijzelaar, Zeist; Ronus de Bode, Bilthoven, and Handricus B. A. Welle, Maarssen, all of Netherlands, assignors to ACF Chemiefarma N.V., Netherlands

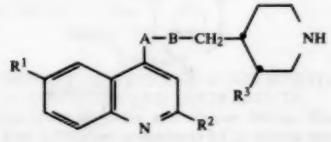
Filed Mar. 5, 1981, Ser. No. 240,817

Claims priority, application Netherlands, Mar. 6, 1980, 8001369; Jul. 11, 1980, 8004002

Int. Cl.³ A61K *31/47;* **C07D** *401/06*

U.S. Cl. 424—258 **4 Claims**

1. A compound of the formula



or a pharmaceutically acceptable salt thereof in which

A—B is —CHOH—CH_2—, —,

R^1 is hydrogen, hydroxy or lower alkoxy,

R^2 is lower alkyl, and

R^3 is ethyl or vinyl,

in which the configuration of the substituents in the 3- and 4-position of the depicted piperdine ring is cis.

3. A pharmaceutical composition comprising a cardiovascularly effective amount of a compound according to claim 1, or a pharmaceutically acceptable salt thereof, in combination with a pharmaceutically acceptable carrier.

4. The method of treating cardiovascular conditions in a human or other animal in need thereof which comprises administering an effective amount of a compound according to claim 1.

4,443,454
THIAZOLIDINONES

Paul A. Worthington, Maidenhead, England, assignor to Imperial Chemical Industries PLC, London, England

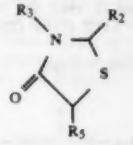
Filed Feb. 9, 1979, Ser. No. 11,051

Claims priority, application United Kingdom, Feb. 17, 1978, 6486/78

Int. Cl.³ A01N *43/40, 43/78;* **C07D** *401/04*

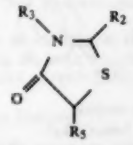
U.S. Cl. 424—263 **4 Claims**

1. A thiazolidinone compound selected from the group consisting of compounds having the formula:



and acid salts and metal complexes thereof, wherein R_2 is 3-pyridyl and R_3 is phenyl or phenyl substituted with one to two halogen atoms or alkyl or haloalkyl groups having from 1 to 4 carbon atoms and R_5 is hydrogen or alkyl having 1 to 4 carbon atoms.

4. A process for combatting plant fungi which comprises treating the fungi with an effective amount of a thiazolidinium compound of the formula:



and acid salts and metal complexes thereof, wherein R_2 is 3-pyridyl and R_3 is phenyl or phenyl substituted with one to two halogen atoms or alkyl or haloalkyl groups having from 1 to 4 carbon atoms and R_5 is hydrogen or alkyl having 1 to 4 carbon atoms.

4,443,455
FUNGIDICAL THIAZOLIDINONES

Paul A. Worthington, Maidenhead, England, assignor to Imperial Chemical Industries PLC, London, England

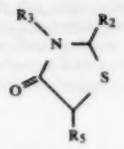
Division of Ser. No. 11,051, Feb. 9, 1979. This application Jan. 13, 1981, Ser. No. 224,669

Claims priority, application United Kingdom, Feb. 17, 1978, 6486/78

Int. Cl.³ A01N *43/78, 43/40;* **C07D** *401/04*

U.S. Cl. 424—263 **1 Claim**

1. A process for combating plant fungi which comprises treating the fungi with a fungicidally effective amount of a thiazolidinone compound of the formula:



or a fungicidal salt or complex thereof, wherein R_3 is 3-pyridyl and R_2 is phenyl or phenyl substituted with one or more halogen atoms, or alkyl or haloalkyl groups having from 1 to 4 carbon atoms and R_5 is hydrogen or alkyl having 1 to 4 carbon atoms and an inert carrier therefor, provided that when R_5 is hydrogen, R_2 is not phenyl or 2-chlorophenyl.

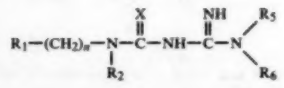
4,443,456

PYRIDYL ALKYLENE AMIDINOUREAS

George H. Douglas, Malvern; William L. Studt, Harleysville; Stuart A. Dodson, Lansdale, and Harry K. Zimmerman, Quakertown, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed May 12, 1981, Ser. No. 262,808
Int. Cl.³ A61K *31/44;* **C07D** *213/46*
U.S. Cl. 424—263 **14 Claims**

1. A compound of the formula

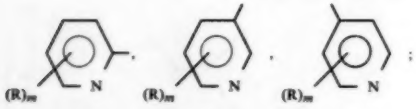


wherein:

n is 1 or 2;

x is O or S;

R_1 is one of the following heterocyclic groups:



and the n-oxides thereof;

R_2 is hydrogen or lower alkyl;

R_5 and R_6 are hydrogen, lower alkyl, cycloalkyl of 3 to 6 carbon atoms, phenyl, lower alkenyl, lower alkoxy, benzyl or phenethyl;

and wherein:

m is zero to four;

R is a ring substituent selected from the group consisting of halogen, lower alkyl, lower alkenyl, phenyl, lower alkynyl, benzyl, phenethyl, nitro, cyano, sulfonyl, hydroxyl, carboxyl, lower alkanoyl, lower alkoxy, phenyl lower alkoxy, halo lower alkoxy, amido, amino, lower alkanoyloxy, lower alkylamino, lower alkoxyamino, and phenyl lower alkoxy amino;

or a pharmaceutically acceptable salt thereof.

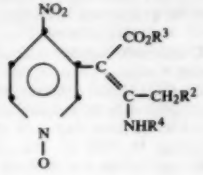
4,443,457

AMINOCROT ONYLPYRIDINE N-OXIDES USEFUL AS ADJUNCTS TO RADIATION THERAPY

George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 19, 1982, Ser. No. 399,612
Int. Cl.³ C07D *213/89;* **A61K** *31/44*
U.S. Cl. 424—263 **5 Claims**

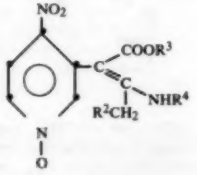
1. A 4-nitropyridine-N-oxide of the formula



wherein R^2 and R^3 are each selected from hydrogen, loweralkyl, hydroxyloweralkyl, and loweralkoxylower alkyl;

R^4 is selected from hydrogen, lower alkyl, hydroxylloweralkyl and loweralkoxylloweralkyl.

4. A method of enhancing the therapeutic effect of radiation which comprises administering to a patient in need of such radiation treatment an effective amount of a compound of the formula



wherein R^2 and R^3 are each selected from hydrogen, loweralkyl, hydroxyloweralkyl and alkoxyloweralkyl lower

R^4 is selected from hydrogen, loweralkyl, hydroxylloweralkyl, and lower alkoxylloweralkyl.

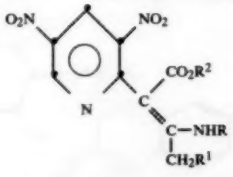
4,443,458

AMINOCROTONYL 3,5-DINITROPYRIDINE USEFUL AS ADJUNCTS TO RADIATION THERAPY

George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 19, 1982, Ser. No. 399,613
Int. Cl.³ C07D *213/61;* **A61K** *31/44*
U.S. Cl. 424—263 **7 Claims**

1. An amino alkenoate ester derivative of 3,5-dinitropyridine having the formula:



wherein R, R^1 and R^2 are the same or different and are each selected from the group consisting of hydrogen, C_{1-6}alkyl, C_{1-6}-mono- or poly-hydroxyalkyl or C_{1-6}aminoalkyl and acid addition salts thereof.

6. A method for enhancing the therapeutic effect of radiation which comprises administering to a patient in need of such radiation treatment an effective amount of a compound of claim **1**.

4,443,459
α-TOCOPHERYL ESTER OF 5-SUBSTITUTED PICOLINIC ACID AND HYPOTENSIVE COMPOSITION CONTAINING IT

Mitsuo Yano, Yokohama; Junji Yoshizawa, Machida; Kiyofumi Ishikawa, Chofu; Nobuo Harada, Okazaki, and Ikuo Matsumoto, Tokyo, all of Japan, assignors to Banyu Pharmaceutical Co., Ltd., Tokyo, Japan

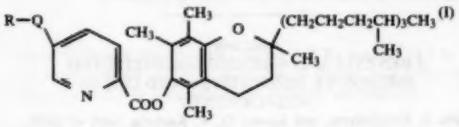
Filed May 19, 1982, Ser. No. 379,060

Claims priority, application Japan, May 26, 1981, 56-78702; Apr. 13, 1982, 57-60359

Int. Cl.³ C07D *405/12;* A61K *31/44*

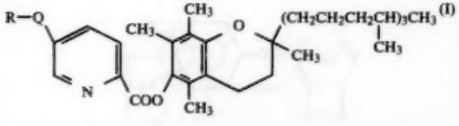
U.S. Cl. 424—266 26 Claims

1. An α-tocopheryl 5-substituted picolinate of the formula



wherein R represents a linear or branched C_1–C_8 alkyl group which may be mono- or di-substituted by a substituent or substituents selected from the class consisting of halogen atoms, acetoxy groups, hydroxyl groups and C_1–C_4 alkyl ether groups, a C_2–C_5 alkenyl group, a phenyl (C_1–C_2) alkyl group, or a phenyl group which may be mono- or di-substituted by a substituent or substituents selected from the class consisting of halogen atoms and nitro groups, and Q represents a methylene group or an oxygen or sulfur atom, or a pharmaceutically acceptable acid addition salt thereof.

26. A pharmaceutical composition for treating hypertension, said composition being composed of a hypotensively effective amount of an α-tocopheryl 5-substituted picolinate of the formula



wherein R represents a linear or branched C_1–C_8 alkyl group which may be mono- or di-substituted by a substituent or substituents selected from the class consisting of halogen atoms, acetoxy groups, hydroxyl groups, and C_1–C_4 alkyl ether groups, a C_2–C_5 alkenyl group, a phenyl (C_1–C_2) alkyl group, or a phenyl group which may be mono- or di-substituted by a substituent or substituents selected from the class consisting of halogen atoms and nitro groups, and Q represents a methylene group or an oxygen or sulfur atom, or a pharmaceutically acceptable acid addition salt, and a pharmaceutically acceptable diluent or carrier.

4,443,460
2-[4-(DIPHENYLMETHYLENE)-1-PIPERIDINYL]-ACETIC ACIDS AND THEIR AMIDES

Ludovic Rodriguez, Brussels, and Eugene Baltes, Rhode-St. Genese, both of Belgium, assignors to UCB, Societe Anonyme, Brussels, Belgium

Filed Sep. 17, 1981, Ser. No. 303,522

Claims priority, application United Kingdom, Sep. 18, 1980, 8030194

Int. Cl.³ A61K *31/445;* C07D *211/22*

U.S. Cl. 424—267 4 Claims

1. 2-[2-[2-[4-(diphenylmethylene)-1-piperidinyl]ethoxy]ethoxy]-acetic acid or a non-toxic pharmaceutically acceptable salt thereof.

4,443,461
N-[2-[[1-[1H-INDOLYLALKYL- OR OXOALKYL]-4-PIPERIDINYL]-AMINO]-2-OXOETHYL]-ARYLCARBOXAMIDE DERIVATIVES

Terence J. Ward, Slough, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

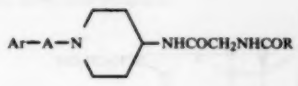
Filed Sep. 10, 1982, Ser. No. 416,773

Claims priority, application United Kingdom, Sep. 10, 1981, 8127408

Int. Cl.³ A61K *31/445;* C07D *409/14, 405/14, 403/06*

U.S. Cl. 424—267 7 Claims

1. A compound of formula



(I)

or a pharmaceutically acceptable salt thereof wherein Ar represents an indolyl group optionally substituted by one or more groups selected from halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro or hydroxy; A represents a straight or branched chain alkylene or oxoalkylene group, each having 2 to 4 carbon atoms; and R represents a phenyl, pyrid-4-yl, thien-2-yl or furan-2-yl group optionally substituted by one or more groups selected from halogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, nitro or hydroxy.

4,443,462
ANTIPSYCHOTIC 4-(NAPHTHALENYLOXY)PIPERIDINE DERIVATIVES

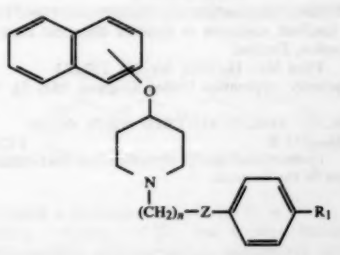
Albert A. Carr, and Robert A. Farr, both of Cincinnati, Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 64,305, Aug. 6, 1979, abandoned. This application Sep. 24, 1982, Ser. No. 422,819

Int. Cl.³ A61K *31/445;* C07D *211/44*

U.S. Cl. 424—267 13 Claims

1. A compound of the formula



wherein n is an integer of from 2 to 5; R_1 is selected from hydrogen, halogen, straight or branched alkyl of from 1 to 4 carbon atoms, and straight or branched alkoxy of from 1 to 4 carbon atoms; and Z is selected from carbonyl and hydroxymethylene; an individual optical isomer, or a pharmaceutically acceptable acid addition salt thereof.

10. A method of obtaining tranquilizing effects in a patient in need thereof comprising administering to said patient a tranquilizing amount of a compound of claim 1.

4,443,463

(5R,6S,8R)-6-(1-HYDROXYETHYL)-2-(HYDROXYALKYLTHIO)-PENEM-3-CARBOXYLATES

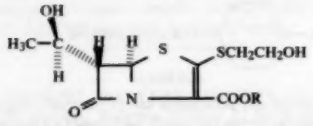
Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 91,610, Nov. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 62,875, Aug. 1, 1979, abandoned, which is a continuation-in-part of Ser. No. 2,471, Jan. 10, 1979, abandoned. This application Nov. 25, 1981, Ser. No. 324,932

Int. Cl.[3] **C07D** *499/00;* **A61K** *31/425*

U.S. Cl. 424—270 **10 Claims**

1. A compound of the formula



wherein R is a member of the group consisting of sodium or potassium cations, phthalidyl and pivaloyloxymethyl.

4,443,464

(+)-2-[1-(2,6-DICHLOROPHENOXY)-ETHYL]-1,3-DIAZACYCLOPENT-2-ENE AND THE METHOD FOR THE TREATMENT OF HUMAN BEINGS SUFFERING FROM NERVOUS DISARRANGEMENTS, IN PARTICULAR MIGRAINE

Jürgen Biedermann, Pulheim-Stommeln; Gerrit Prop, Pulheim, and Ilie-Stephanie Doppelfeld, Bergheim-Glessen, all of Fed. Rep. of Germany, assignors to A. Nattermann & Cie GmbH, Cologne, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,944

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3149010

Int. Cl.[3] **A61K** *31/415*

U.S. Cl. 424—273 **4 Claims**

1. Method for the treatment of human beings suffering from migraine, comprising administering to such human beings between 0.05 to 50 mg of (+)-2-[1-(2.6-dichlorophenoxy)-ethyl]-1.3-diazacyclopent-2-ene per each dose unit or the equivalent amount of a pharmaceutically acceptable acid addition salt thereof.

4,443,465

ALDOSE REDUCTASE INHIBITORY PYRROLE DERIVATIVES

David R. Brittain, Macclesfield, and Robin Wood, Hazel Grove, both of England, assignors to Imperial Chemical Industries PLC, London, England

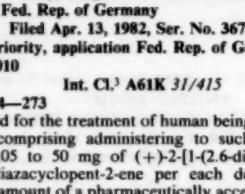
Filed May 11, 1982, Ser. No. 377,133

Claims priority, application United Kingdom, May 12, 1981, 8114402

Int. Cl.[3] **A61K** *31/415;* **C07D** *493/20, 495/20*

U.S. Cl. 424—273 R **9 Claims**

1. A 1-substituted-spiro[4-pyrroline-3,4'-imidazolidine]-2,2',5'-trione of the formula:



I

wherein Ra is a benzyl radical optionally bearing up to three substituents independently selected from halogeno, trifluoromethyl, (1–4 C)alkyl, (1–4 C)alkoxy, nitro, (1–4 C)alkylthio and cyano radicals; or a halogenocinnamyl radical; and ring A stands for the benzene ring of a benzo[b]thiophene or benzo[b-]furan which may bear one or two substituents independently selected from (1–4 C)alkyl, (1–4 C)alkoxy and phenyl substituents located on the benzene or heterocyclic ring; or a pharmaceutically acceptable base-addition salt thereof; or a non-toxic, biodegradable precursor thereof.

9. A method of inhibiting the enzyme aldose reductase in a warm-blooded animal requiring such treatment which comprises administering to said animal an aldose reductase inhibitory amount of a 1-substituted-sprio[4-pyrroline-3,4'-imidazolidine]-2,2',5'-trione of the formula I, or a pharmaceutically acceptable base-addition salt thereof, or a non-toxic biodegradable precursor thereof as claimed in claim 1.

4,443,466

4-BENZYL- AND 4-BENZOYL-SUBSTITUTED IMIDAZOLE DERIVATIVES AND USE AS MEDICAMENTS

Arto J. Karjalainen, and Kauko O. A. Kurkela, both of Oulu, Finland, assignors to Farmos-Yhtyma OY (Farmos Group Ltd.), Turku, Finland

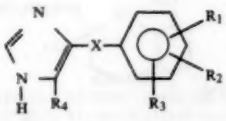
Continuation-in-part of Ser. No. 64,575, Aug. 7, 1979, abandoned. This application Mar. 10, 1981, Ser. No. 242,234

Claims priority, application European Pat. Off., Jan. 8, 1980, 80 302 637.6; Finland, Jan. 8, 1980, 802404; Israel, Jan. 8, 1980, 60723; New Zealand, Jan. 8, 1980, 194536; Australia, May 8, 1980, 61071/80; Ireland, May 8, 1980, 1626/80; Canada, Jun. 8, 1980, 357663; Denmark, Jun. 8, 1980, 3385/80; German Democratic Rep., Jun. 8, 1980, 223182; Hungary, Jun. 8, 1980, 1955/80; Japan, Jun. 8, 1980, 55-108786; Norway, Jun. 8, 1980, 802352; South Africa, Jun. 8, 1980, 80/4787; U.S.S.R., Jun. 8, 1980, 2959548

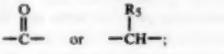
Int. Cl.[3] **C07D** *233/66, 233/54;* **A61K** *31/40*

U.S. Cl. 424—274 **141 Claims**

1. A compound of the formula:

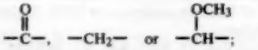


wherein R_1, R_2 and R_3, which can be the same or different, are each hydrogen, chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy or nitro; R_4 is hydrogen or alkyl of 1 to 7 carbon atoms; —X— is



R_5 is hydrogen, hydroxy or $—OR_6$; and R_6 is alkyl of 1 to 7 carbon atoms or aryl of 6 to 10 carbon atoms; or a non-toxic pharmaceutically acceptable acid addition salt thereof; with the provisos that:

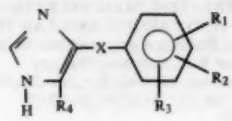
(a) when R_1, R_2 and R_3 are simultaneously hydrogen, then —X— is other than



and

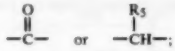
(b) when R_1 is 2-methyl, R_2 is 5-methyl, R_3 is hydrogen and R_4 is methyl, then —X— is other than $—CH_2—$.

122. A method for treating a mammal exhibiting an ulcerous condition, which comprises administering to said mammal an anti-ulcer effective amount of a compound of the formula:



(I)

wherein R_1, R_2 and R_3, which can be the same or different, are each hydrogen, chloro, bromo, fluoro, methyl, ethyl, methoxy, amino, hydroxy or nitro; R_4 is hydrogen or alkyl of 1 to 7 carbon atoms; —X— is



R_5 is hydrogen, hydroxy or $—OR_6$; and R_6 is alkyl of 1 to 7 carbon atoms or aryl of 6 to 10 carbon atoms; or a non-toxic pharmaceutically acceptable acid addition salt thereof.

4,443,467

ANTIDIARRHOEAL AGENTS

Terence J. Ward, Slough, United Kingdom, assignor to John Wyeth & Brother, Limited, Maidenhead, England

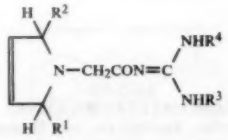
Filed May 11, 1981, Ser. No. 262,148

Claims priority, application United Kingdom, May 27, 1980, 8017377; Feb. 12, 1981, 8104410

Int. Cl.³ A61K *31/40, 31/505, 31/415*

U.S. Cl. 424—274 **3 Claims**

1. A method of treating or preventing diarrhoea in mammals or poultry which comprises administering to an animal in need thereof an amount effective for treating or preventing diarrhoea of a guanidine of formula (I)



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein R^1 and R^2 each represents lower alkyl or trifluoromethyl and R^3 and R^4 each represents hydrogen or lower alkyl or R^3 and R^4 together represent dimethylene or trimethylene.

4,443,468

BENZOFURAN DERIVATIVES, PROCESS FOR THEIR PREPARATION AND THEIR THERAPEUTIC APPLICATIONS

J. Georges Maillard, Versailles, and Jacky Legeai, Palaiseau, both of France, assignors to Laboratoires Jacques Logeais, Issy-les Moulineaux, France

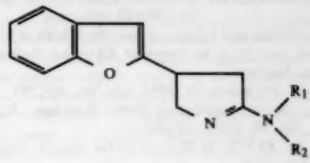
Division of Ser. No. 54,626, Jul. 3, 1979, Pat. No. 4,339,384. This application Mar. 5, 1982, Ser. No. 355,331

Claims priority, application France, Jul. 17, 1978, 78 21188

Int. Cl.³ A61K *31/40*

U.S. Cl. 424—274 **3 Claims**

1. A therapeutic composition having an antidysrhythmic activity containing an anti-dysrhythmic effective amount of a compound selected from the group consisting of compounds having the formula:



wherein R_1 and R_2 are C_{1-6} alkyl groups, and a pharmacologically acceptable acid addition salt thereof, and a therapeutically acceptable excipient.

4,443,469

URIC ACID-LOWERING COMPOSITION, METHOD AND USE

Masahisa Nishizono, Fukuoka, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 22, 1982, Ser. No. 421,096

Claims priority, application Japan, Sep. 24, 1981, 56-151062

Int. Cl.³ A61K *31/38*

U.S. Cl. 424—275 **3 Claims**

1. A method for treating gout which comprises administering a uric acid-lowering amount of 2-chloro-11-(2-dimethylaminoethyl) dibenzo [b,f]-thiepin or its pharmaceutically acceptable salt to a human being having uric acid abnormality.

4,443,470

METHOD OF PROMOTING GROWTH AND ENHANCING FEED EFFICIENCY IN MEAT PRODUCING ANIMALS

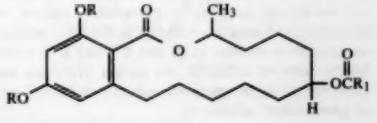
Edward B. Hodge, and Glen W. Wolfrom, both of Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed Sep. 3, 1981, Ser. No. 299,270

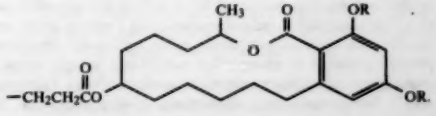
Int. Cl.³ A61K *31/335*

U.S. Cl. 424—279 **17 Claims**

1. A method of promoting growth in a food-producing animal, the steps comprising administering to said animal a growth promoting amount of a compound represented by the following structural formula



in which R is hydrogen; and wherein R_1 is $—C_5H_{11}$, $—C_9H_{19}$, $—C_3H_7$, and $C_{11}H_{23}$, trifluoromethyl, trichloromethyl, tribromomethyl, nitrophenyl, aminophenyl or a group of the formula

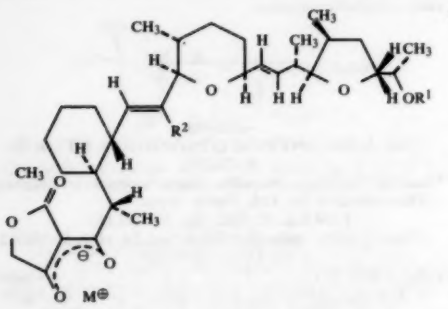


4,443,471
DERIVATIVES OF M.139,603 USEFUL AS GROWTH PROMOTERS

David H. Davies, and Michael J. Smithers, both of Macclesfield, England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 21, 1982, Ser. No. 390,773
Claims priority, application United Kingdom, Jul. 16, 1981, 8122027; Jul. 20, 1981, 8122307
Int. Cl.³ C07D 407/14; A61K 31/365, 31/71
U.S. Cl. 424—279 6 Claims

1. A derivative of M.139,603 of the formula:



I

wherein:

M^+ is an alkali metal, alkaline earth metal, ammonium, alkylammonium or hydroxyalkylammonium cation;

R^1 is a hydrogen atom, an alkyl radical or an optionally substituted phenylalkyl radical; and

R^2 is a formyl, iminomethyl, hydroxyiminomethyl or aminomethyl radical, or a radical of the formula —CH:NR^3, —CH:NOR^4 or —$CH_2NR^5R^6$ wherein R^3, R^4, R^5 and R^6 may each be an alkyl or an optionally substituted phenyl or phenylalkyl radical; or

a radical of the formula —CH_2OR^7 wherein R^7 is an alkyl, alkenyl, alkynyl, alkoxycarbonyl or alkylaminoalkyl radical or an optionally substituted phenylalkyl radical; or

a radical of the formula —$CH_2O.COR^8$ wherein R^8 is an alkyl, cycloalkyl, (cycloalkyl)alkyl, halogenoalkyl, hydroxyalkyl, alkoxyalkyl, aminoalkyl, mono- or di-alkylaminoalkyl, alkoxycarbonylalkyl, carboxyalkyl, carbamoylalkyl, N-alkylcarbamoylalkyl, N,N-dialkylcarbamoylalkyl or optionally substituted phenyl, naphthyl or phenylalkyl radical; or

a radical of the formula —$CH_2O.CO.COR^9$ wherein R^9 is an amino, mono- or di-alkylamino, alkoxy or optionally substituted phenyl, naphthyl or phenylalkyl radical; or

a radical of the formula —$CH_2O.CX.NR^{10}R^{11}$ wherein X is an oxygen or sulphur atom and R^{10} and R^{11}, which may be the same or different, are each a hydrogen atom, an alkyl radical or an optionally substituted phenyl, naphthyl or phenylalkyl radical; or,

when R^1 is a hydrogen atom or an alkyl radical of 2 or more carbon atoms or an optionally substituted phenylalkyl radical, R^2 is a hydroxymethyl radical,

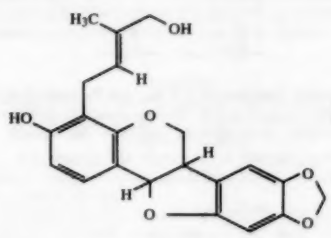
and wherein each alkyl, alkenyl or alkynyl radical contains up to 6 carbon atoms, and wherein, in each complex radical containing an alkyl part, the said alkyl part contains 1 to 6 carbon atoms, and wherein each cycloalkyl radical or cycloalkyl part of a (cycloalkyl)alkyl radical contains 3 to 7 carbon atoms and wherein the optional substituent in the optionally substituted phenyl, naphthyl or phenylalkyl radical is a halogen atom, a nitro, cyano or hydroxy radical, or an alkyl, alkoxy, halogenoalkyl, halogenoalkoxy, alkylamino, dialkylamino or alkanoylamino radical of up to 8 carbon atoms.

4,443,472
METHOD OF TREATING MAMMALS FOR EFFECTS OF NEURO- AND CARDIOVASCULAR TOXINS

Laszlo L. Darko, Redding, Conn., assignor to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

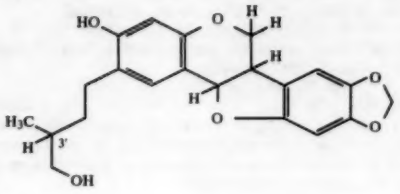
Filed Mar. 15, 1982, Ser. No. 358,191
Int. Cl.³ A61K 31/36, 35/78
U.S. Cl. 424—282 4 Claims

1. A therapeutic composition in dosage form for oral administration comprising a pharmaceutically acceptable solid or liquid carrier and a compound selected from the group consisting of (I) and (II).



(I)

and



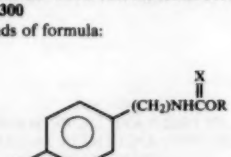
(II)

4,443,473
CARBAMATE DERIVATIVES

Brian L. Buckwalter, Yardley, Pa., and Thomas R. LaHann, Cleves, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

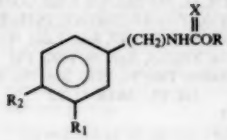
Continuation-in-part of Ser. No. 279,091, Jun. 30, 1981, abandoned. This application Jun. 3, 1982, Ser. No. 384,685
Int. Cl.³ C07C 125/06; A61K 31/27
U.S. Cl. 424—300 25 Claims

1. Compounds of formula:



wherein X is O or S, wherein R is C_3–C_{12} alkyl or aralkyl, branched or unbranched, aryl or haloaryl, C_3–C_{22} alkenyl, branched or unbranched, or benzyl, wherein R_1 is H, OH or OCH_3 and R_2 is H or OH, at least one of R_1 and R_2 being OH or OCH_3; and pharmaceutically acceptable salts thereof.

15. A method for providing analgesia in humans and lower animals in need thereof, which comprises the step of administering to the human or lower animal a safe and effective amount of a compound of formula:



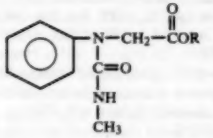
wherein X is O or S, wherein R is C_3–C_{12} alkyl or aralkyl, branched or unbranched, aryl or haloaryl, C_3–C_{22} alkenyl, branched or unbranched, or benzyl, wherein R_1 is H, OH or OCH_3 and R_2 is H or OH, at least one of R_1 and R_2 being OH, or a pharmaceutically acceptable salt thereof.

4,443,474
PHARMACEUTICAL N-PHENYL CARBAMOYL GLYCINATE COMPOSITIONS

Krishen L. Nagpal, Williamsville, N.Y., assignor to Buffalo Color Corporation, West Paterson, N.J.

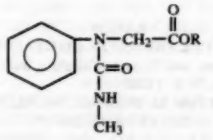
Filed Aug. 6, 1982, Ser. No. 406,009
Int. Cl.³ C07C *101/24*; A61K *31/24*
U.S. Cl. 424—309 **13 Claims**

1. An anti-convulsant compound of the formula:



wherein R is lower alkyl.

8. A method of producing anti-convulsant activity which comprising administering internally, to an animal organism in need of such activity, an amount of a compound of the formula:



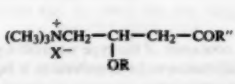
wherein R is lower alkyl; sufficient to produce said activity.

4,443,475
AMIDES OF ACYL-CARNITINES, PROCESS FOR PREPARING SAME AND PHARMACEUTICAL COMPOSITIONS CONTAINING SUCH AMIDES

Claudio Cavazza, 35, Via Marocco, 00144 Rome, Italy

Continuation of Ser. No. 142,504, Apr. 21, 1980, abandoned. This application May 26, 1982, Ser. No. 382,275
Claims priority, application Italy, Apr. 23, 1979, 48816 A/79
Int. Cl.³ A61K *31/23*; C07C *103/54*
U.S. Cl. 424—311 **7 Claims**

1. An amide of an acyl-carnitine represented by the formula (I)



wherein X^- is a halogen anion; R is acetyl; halogen-substituted acetyl; propionyl; halogen-substituted propionyl; butyryl; halogen-substituted butyryl; isobutyryl; β-hydroxy butyryl; acetoacetyl, linoleyl or pantothenyl; and R″ is amino provided that R is not acetyl, propionyl or butyryl, or R″ is 2-sulfonyl-ethylamino, (2-hydroxy-3-carbethoxy-propyl) amino, (1-carbomethoxy-2-methyl-propyl) amino, (1-carbomethoxy-3-methyl-n-butyl) amino, (1-carbomethoxy-2-methyl-n-butyl) amino, (1,2-dicarbomethoxy-ethyl) amino, (1,3-dicarbomethoxy-propyl) amino, (2-carbethoxy-benzyl) amino, (4-carbethoxy-phenyl) amino, 2-mercapto-1-carbomethoxy-ethyl) amino, 2-mercaptoethyl amino, (5-trimethyl ammomonium chloride-1-carbethoxy pentyl) amino, (carbethoxy methyl) amino or (carbethoxy ethyl) amino radical.

5. A composition for the treatment of functional arrhythmias, arrythmias secondary to myocardial-sclerotic diseases and barbiturate-induced depressions and for use as psychostimulant which comprises an amide of formula (I) as defined in claim 1 in a pharmaceutically effective amount and a pharmacologically acceptable excipient.

4,443,476
TREATMENT OF ADULT RESPIRATORY DISTRESS SYNDROME

Pavel L. Lomen, Plainwell, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 284,414, Jul. 26, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,050
Int. Cl.³ A61K *31/19*
U.S. Cl. 424—317 **2 Claims**

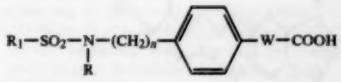
1. A process for treating adult respiratory distress syndrome comprising the systemic administration to a human or animal having adult respiratory distress syndrome of an effective amount of 3-fluoro-4-phenylhydratropic acid or an alkyl ester of from 1 to 8 carbon atoms, inclusive, including isomeric forms thereof, or a pharmacologically acceptable salt thereof.

4,443,477
SULPHONAMIDOPHENYLCARBOXYLIC ACID COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Ernst-Christian Witte, Mannheim; Hans P. Wolfe, Hirschberg-Grossachsen; Karlheinz Stegmeier, Heppenheim, and Egon Roesch, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Continuation of Ser. No. 215,469, Dec. 11, 1980, abandoned. This application Jul. 7, 1982, Ser. No. 395,882
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1980, 3000377
Int. Cl.³ C07C *143/78*; A61K *31/18*
U.S. Cl. 424—319 **33 Claims**

1. Sulphonamide compound of the formula



(I)

wherein

R is hydrogen or lower alkyl;

R_1 is alkyl of up to 16 carbon atoms except when R is H, aryl having 6 to 14 carbon atoms, aralkyl with an alkyl moiety of up to 5 carbon atoms or aralkenyl with an alkenyl moiety of 2 or 3 carbon atoms, the aryl moiety of which in either case having 6 to 14 carbon atoms and being optionally substituted with one or more hydroxyl, fluorine, chlorine, bromine, trifluoromethyl, lower alkyl or alkoxy or by acetyl, carboxy or alkoxycarbonyl with 1–5 carbon atoms in the alkoxy moiety, radical;

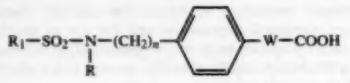
n is 1, 2 or 3; and

W is a valence bond or a divalent aliphatic hydrocarbon linkage having up to 6 carbon atoms; and

the physiologically acceptable salt, lower alkyl ester or

amide of the WCOOH group of such compound wherein the amide component is selected from the group consisting of ammonia, p-aminobenzoic acid, beta-alanine; ethanolamine, 2-aminopropanol, alkylamine, dialkylamine, 4-alkylpiperazine, 4-aralkylpiperazine and 4-arylpiperazine.

31. Composition for depressing lipids, and inhibiting thrombocyte aggregation, which composition comprises a pharmacologically acceptable carrier and, in effective amounts, a sulphonamide compound of the formula



(I)

wherein

R is hydrogen or lower alkyl;

R_1 is alkyl of up to 16 carbon atoms, aryl of 6 to 14 carbon atoms or aralkenyl with an alkenyl moiety of 2 to 3 carbon atoms the aryl moiety of which in either case having 6 to 14 carbon atoms and being optionally substituted with one or more hydroxyl, fluorine, chlorine, bromine, trifluoromethyl, lower alkyl or alkoxy or by acetyl lower alkanyl, carboxy or alkoxycarbonyl with 1 to 5 carbon atoms in the alkoxy moiety, radical;

n is 1, 2 or 3; and

W is a valence bond or a divalent aliphatic hydrocarbon linkage, and

the physiologically acceptable salt, lower alkyl ester or amide of the WCOOH group of such compound wherein the amide component is selected from the group consisting of ammonia, p-aminobenzoic acid, beta-alanine; ethanolamine, 2-aminopropanol, alkylamine, dialkylamine, 4-alkylpiperazine, 4-aralkylpiperazine and 4-arylpiperazine.

4,443,478

PROSTAGLANDIN ANALOGUES

Takashi Muryobayashi; Hajimu Miyake, and Takashi Yamato, all of Takatsuki, Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

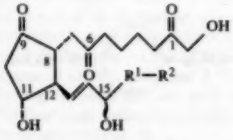
Filed Jun. 28, 1982, Ser. No. 392,676

Claims priority, application Japan, Jun. 29, 1981, 56-99724; May 25, 1982, 57-87229

Int. Cl.[3] **C07C** *177/00*; **A61K** *31/215*

U.S. Cl. 424—331 **10 Claims**

1. A prostaglandin E_1 analogue of the formula:



(IV)

[wherein R^1 represents a direct bond or a straight- or branched-chain alkylene group containing from 1 to 5 carbon atoms(s), and R^2 represents a hydrogen atom, a straight- or branched-chain alkyl group containing from 1 to 8 carbon atom(s), a cycloalkyl group containing from 4 to 7 carbon atoms in the ring and unsubstituted or substituted by at least one straight- or branched-chain alkyl group containing from 1 to 8 carbon atom(s) or a phenyl or phenoxy group unsubstituted or substituted by at least one halogen atom, trifluoromethyl group or straight- or branched-chain alkyl group containing from 1 to 4 carbon atom(s), with the proviso that, when R^1 represents a direct bond, R^2 does not represent a phenoxy group] or a cyclodextrin clathrate thereof.

4,443,479

PHARMACEUTICAL METHODS AND COMPOSITIONS USING PARABENZOQUINONE

Channing B. Ewing, P.O. Box 47, East Lake Weir, Fla. 32632

Division of Ser. No. 370,066, Apr. 20, 1982, Pat. No. 4,382,095. This application Feb. 14, 1983, Ser. No. 466,141

Int. Cl.[3] **A61K** *31/12*

U.S. Cl. 424—331 **2 Claims**

1. A method for treating the symptoms of:

migrane headaches,

peptic ulcer,

sinus headaches,

senile dementia,

comprising administering to a person suffering therefrom an effective amount of parabenzoquinone and continuing said administration, as required, until the symptoms have been alleviated.

4,443,480

ARTIFICIAL BLOOD AND OTHER GAS TRANSPORT AGENTS

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed Apr. 12, 1982, Ser. No. 367,457

Int. Cl.[3] **A61K** *31/025, 31/02*

U.S. Cl. 424—352 **30 Claims**

1. A gas transport agent liquid composition containing a perfluorocyclocarbon and an organoamine oxide.

5. The composition of claim **1** wherein the perfluorocyclocarbon is a perfluorinated compound selected from the group consisting of an adamantane, substituted adamantane, decalin, substituted decalin, bicyclononane, substituted bicyclononane, and mixtures thereof.

4,443,481

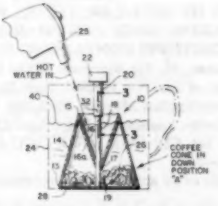
COFFEE INFUSION CONTAINER

Angelo Donarumma, and Thomas Callahan, both of 9 Longworth Ave., Dix Hills, N.Y. 11746

Filed Feb. 14, 1983, Ser. No. 432,787

Int. Cl.[3] **B65B** *29/04*

U.S. Cl. 426—82 **3 Claims**



1. An infusion container of the type wherein a porous enclosure contains a substance to be dissolved in a liquid, wherein the improvement comprises:

(a) an enclosure having an exterior shape in the form of a truncated cone the upper most section being removed and, connected to the uppermost section of said truncated

cone, a center section which extends down toward a base connected to the lowermost portion of said truncated cone, said center section being shaped relative to said truncated cone in the form of an inverted cone; the enclosure containing and retaining said substance being defined by said truncated cone, said inverted cone, and said base, all of which are porous

(b) a rod shaped handle with one end of said handle rigidly fixed to said base of said enclosure and with the lowermost and most tapered portion of the center section inverted cone affixed to the rod handle along the length of said rod shaped handle spaced from said one end, and with the end of said handle opposite said one end projecting outside the enclosure so that the user may hold the enclosure while a hot liquid is poured into the middle section of said inverted cone said rod shaped handle giving rigidity to the enclosure so that the enclosure retains its shape when dunked into the liquid; said base comprising a rigid porous member, said truncated cone comprising filter paper, and said inverted cone comprising a dual layer of filter paper and a rigid porous member.

4,443,482

BUTTERED TABLE SYRUP IN POLYOLEFIN BOTTLE

Larry D. Schopf, Saginaw; Jerome K. Sakowicz, Springfield, and Hugh L. Trenk, Augusta, all of Mich., assignors to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 197,837, Oct. 17, 1980, Pat. No. 4,321,279. This application Mar. 23, 1982, Ser. No. 360,969

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ A23L *1/09, 3/34;* **B65B** *29/00*

U.S. Cl. 426—106 **11 Claims**

1. A bottled buttered table syrup comprising a polyolefin container containing a table syrup, said table syrup containing at least about 65% by weight sugar solids, butter in an amount of 1–5% by weight based on the weight of the syrup, and from 0.05 to 0.52% by weight of an emulsifier, said emulsifier containing from 0.01 to 0.2% by weight, based on the weight of the syrup, of carrageenin, and from 0.01 to 0.2% by weight, based on the weight of the syrup, of pectin.

4,443,483

METHOD FOR INHIBITING NITROSAMINE FORMATION DURING COOKING OF MEAT

Kunito Sato, Scottsdale, Ariz., and Richard F. Theiler, Harrington Park, N.J., assignors to Armour Food Company, Phoenix, Ariz.

Filed Jun. 28, 1982, Ser. No. 392,848

Int. Cl.³ A23B *4/02, 4/14*

U.S. Cl. 426—266 **15 Claims**

1. In a nitrite-curing process for meat, the improvement comprising the step of introducing into said meat a gamma pyrone in combination with a reducing sugar in amounts sufficient to inhibit production of nitrosamines during subsequent cooking of said meat.

4,443,484

METHOD FOR PRESERVATION OF MEAT PRODUCTS

Robert V. Dahlstrom, Novato, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 11, 1983, Ser. No. 483,801

Int. Cl.³ A23B *4/14*

U.S. Cl. 426—266 **4 Claims**

1. A method of inhibiting the growth of *Clostridium botulinum* in meat products comprising incorporating into a meat product an effective amount of the compound 3-(4-tolylsulfonyl) acrylonitrile and an alkali metal nitrite salt in an amount less than 120 ppm.

4,443,485

UTILIZATION OF AN AROMATIC ALDEHYDE 4-METHYL-2-HYDROXY-BENZALDEHYDE AS FLAVORING INGREDIENT

Sina D. Escher, le Lignon, and Paul Dietrich, Troinex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

Filed Apr. 15, 1982, Ser. No. 368,508

Claims priority, application Switzerland, May 21, 1981, 3314/81

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—538 **2 Claims**

1. A method to enhance, modify or improve the sweet gustative note of caramel and burnt type reminiscent of coumarin of foodstuffs and beverages which comprises the step of adding thereto from about 0.1 to 10 parts per million by weight of 4-methyl-2-hydroxy-benzaldehyde based on the total weight of the resulting flavored foodstuffs and beverages.

4,443,486

MODIFIED EXTRACTIVE OF *EUCHEUMA COTTONII* SEAWEED AND COMPOSITION CONTAINING SAME

Kenneth B. Guiseley, Hope, Me., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 138,947, Apr. 9, 1980, abandoned. This application Mar. 11, 1981, Ser. No. 242,799

Int. Cl.³ C08B *37/00;* **A23G** *1/00;* **A23C** *9/154*

U.S. Cl. 426—584 **6 Claims**

1. A modified sulfated hydrocolloid extractive of *Eucheuma cottonii* for use in stabilizing milk-based products, said hydrocolloid in the form of a salt of calcium, magnesium, potassium or sodium or a mixture thereof, being characterized in that the viscosity in a 1.5% water solution is between 5 and 20 mPa.s at 75° C.

5. A chocolate milk stabilized with the hydrocolloid as defined in claim 1, 2 or 3.

4,443,487

PROCESS FOR PRODUCING A SPREADABLE EMULSION

Donald F. Darling, Denton, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,729

Claims priority, application United Kingdom, Feb. 27, 1981, 8106209

Int. Cl.³ A23D *3/02*

U.S. Cl. 426—603 **15 Claims**

1. A process for producing an edible spreadable margarine-like emulsion, which comprises:

(a) producing an oil-in/water emulsion which comprises

(i) 20–80 wt.% of a dispersed fat having at 10° C. a solid fat content exceeding 40%, of which the average major dimension does not exceed 6 microns;

(ii) 80–20 wt.% of an aqueous phase; and

(iii) an effective amount of an emulsifier conducive to surface nucleation of fat crystals, deformation of the dispersed fat and/or growth of fat crystals through the oil/-water interface into the aqueous phase;

(b) simultaneously subjecting said emulsion to a mild shearing regime resulting from turbulent or non-turbulent flow conditions together with a cooling regime wherein said emulsion is cooled to a temperature ranging from 0° to 15° C. to allow fat crystallization to take place and at least partly achieve phase inversion;

(c) applying a temperature cycling involving warming up the cooled emulsion to a temperature ranging from 25° to 45° C. at which partial melting occurs; and

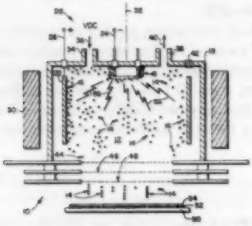
(d) cooling to a temperature at which the fat at least partly recrystallizes.

4,443,488

PLASMA ION DEPOSITION PROCESS

Roger G. Little, Bedford; Robert G. Wolfson, Concord, and Stanley J. Solomon, Lexington, all of Mass., assignors to Spire Corporation, Bedford, Mass.

Filed Oct. 19, 1981, Ser. No. 312,712
Int. Cl.³ B05D 3/06
U.S. Cl. 427—38 **6 Claims**



1. A process of plasma ion deposition of large grain, thin semiconductor films comprising:

(a) ionizing a semiconductor-based gaseous compound;

(b) extracting the semiconductor ions from said compound;

(c) depositing said extracted ions on a substrate in two stages: at an initial slow deposition rate not exceeding 25 microns per hour, followed by a higher deposition rate greater than 50 microns per hour; and

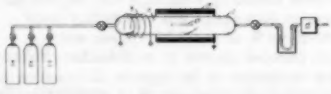
(d) permitting said deposited ions to coalesce and to grow into a large-grain, thin semiconductor film on said substrate.

4,443,489

METHOD FOR THE FORMATION OF PHOSPHOROUS-NITROGEN BASED GLASSES USEFUL FOR THE PASSIVATION OF III-V SEMICONDUCTOR MATERIALS

Melvyn E. Cowher, East Brookfield, Mass., and Alexander J. Shuskus, West Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 10, 1983, Ser. No. 493,181
Int. Cl.³ B05D 5/12
U.S. Cl. 427—38 **5 Claims**



1. A method for depositing a thin, amorphous, glass-like corrosion resistant film of phospham on a III–V semiconductor material including the following steps:

placing the III–V semiconductor material in a reaction chamber;

raising the temperature of the material to about 260° C. to about 270° C. by contacting the material with an RF induced hydrogen plasma; and

then spontaneously depositing the phospham on the material by contacting the material with an RF induced plasma of phosphorous, nitrogen and hydrogen.

4,443,490

MAGNETIC RECORDING MEDIUM

Kaoru Nakajima; Kunio Kobayashi, and Yoshiaki Hisagen, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

Division of Ser. No. 174,871, Aug. 4, 1980, abandoned. This application Nov. 18, 1982, Ser. No. 442,845
Claims priority, application Japan, Aug. 6, 1979, 54-100145; Aug. 8, 1979, 54-101133
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 **6 Claims**

1. A method of manufacturing a magnetic recording medium which comprises:

coating a magnetic paint composed of magnetic powder and a binder on a non-magnetic substrate to form a coating layer, said binder containing an acrylic compound having at least two unsaturated bonds per molecule and a thermoplastic resin in a weight ratio of 80:20 to 20:80,

preliminarily irradiating the coating layer with an ionizing radiation at a dose amount of 0.1 to 3 Mrad;

subjecting the coating layer to a calender treatment; and

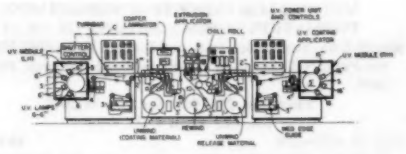
irradiating the calendered coating layer with an ionizing radiation at a dose amount of from 1 to 10 Mrad to fully cure the coating layer.

4,443,491

METHOD OF AND APPARATUS FOR PRODUCING ADHESIVE-COATED SHEET MATERIALS USABLE WITH RADIATION-CURED SILICONE RELEASE COATINGS AND THE LIKE

Frederic S. McIntyre, Wellesley, Mass., assignor to Acumeter Laboratories, Inc., Marlborough, Mass.

Filed Jun. 10, 1982, Ser. No. 386,922
Int. Cl.³ B05D 3/06
U.S. Cl. 427—44 **18 Claims**



1. A method of producing sheet material carrying an adhesive coating on one surface and adapted for use with radiation-curved silicone for enabling release of the sheet material in stacking, that comprises, applying uncured silicone coating material to one surface of a sheet as the sheet travels continuously in web form; radiation-curing said silicone coating during travel of the web to provide a cross-linked release coating; controlling the degree of radiation-curing in accordance with the travel speed of the web to provide sufficient curing without overcuring; applying adhesive to one of (1) the other surface of said sheet and (2) a second sheet during travel of the web, and hardening the adhesive during travel of the web; and stacking, as by rolling at the travel speed of the web, by one of (1) winding the cured silicone coated and adhesive coated sheet and (2) winding the cured silicone-coated sheet with the adhesive-coated sheet and with the coatings in the contact.

4,443,492
RATE OF ABSORBENCY OF SUBSTRATES CONTAINING IN-SITU POLYMERIZED MONOMERS

Judy Roller, North Brunswick, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed Apr. 18, 1983, Ser. No. 485,783
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—44 **6 Claims**

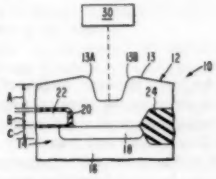
1. In a process for producing an absorbent composite wherein a formed fibrous substrate has applied thereto an aqueous solution comprising an ammonium or alkali metal salt of acrylic or methacrylic acid and is then irradiated with sufficient electromagnetic or corpuscular ionizing radiation to convert said salt of acrylic or methacrylic acid to a water swellable polymer, the improvement wherein:

said irradiated substrate is saturated with an aqueous liquid and then dried to a moisture content of less than 20 percent, by weight whereby said dried substrate exhibits rapid absorption properties.

4,443,493
LASER INDUCED FLOW GLASS MATERIALS

Michelangelo Delfino, Los Altos, Calif., assignor to Fairchild Camera and Instrument Corp., Mountain View, Calif.

Continuation-in-part of Ser. No. 300,706, Jun. 30, 1981, which is a continuation of Ser. No. 143,983, Apr. 28, 1980, abandoned. This application Jan. 15, 1982, Ser. No. 339,600
Claims priority, application United Kingdom, Feb. 6, 1981, 8103773; Italy, Feb. 23, 1981, 67249 A/81
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—53.1 **3 Claims**



1. A method of inducing flow or densification of a first glass portion of an integrated circuit structure in close proximity to a second portion of the structure containing different material, the first portion being of the type wherein flow or densification is induced therein upon application of heat thereto, comprising:

heating the first portion, by a laser beam having an emission coupled to the absorption band of said glass, to an extent substantially greater than the second portion, said structure being subjected to successive overlapping laser scans by said laser beam, each scan having a dwell time sufficiently low to prevent formation of bubbles in the flowed glass.

4,443,494
METHOD FOR JOINING OBJECTS

Donald I. Gonser, York, Pa., assignor to Dentsply Research and Development Corporation, Milford, Del.

Continuation-in-part of Ser. No. 234,473, Feb. 17, 1981, abandoned, and a continuation-in-part of Ser. No. 276,656, Jun. 23, 1981, abandoned. This application Feb. 1, 1983, Ser. No. 462,818
Int. Cl.³ B05D *3/06*
U.S. Cl. 156—64 **24 Claims**

1. A process for accurately joining together a first object and a second object into a preselected spatial orientation comprising:

contacting said first object and said second object with at least one portion of a polymerizable composition hardenable through irradiation with actinic light,

causing light to be emitted from at least one of said objects, evaluating said light,

positioning said objects relative to each other in response to said evaluation to attain said preselected spatial orientation; and

irradiating said portion with actinic light for a time sufficient to cause said composition to polymerize substantially to hardness, fixedly to maintain said preselected spatial orientation to a high degree of accuracy.

9. A process for accurately joining together a first object and a second object into a preselected spatial orientation comprising:

contacting said first object and said second object with at least one portion of a polymerizable composition hardenable through irradiation with visible light comprising:

a binder resing,

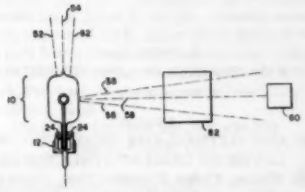
a diluent monomer, and

a photosensitizing system comprising:

an alpha diketone, and

an amine reducting agent,

causing light to be emitted from at least one of said objects, evaluating said light,



positioning said objects relative to each other in response to said evaluation to attain said preselected spatial orientation; and

irradiating said portion with visible light for a time sufficient to cause said composition to polymerize substantially to hardness fixedly to maintain said preselected spatial orientation to a high degree of accuracy.

19. A process for accurately joining a lamp bulb portion to a lamp base portion into a preselected spatial orientation comprising:

contacting said bulb and said base portions with at least one portion of a polymerizable composition hardenable through irradiation with visible light,

causing said bulb portion to emit light, said light transiting said bulb portion and impinging upon light evaluation means,

evaluating said light,

positioning said bulb and base portions in response to said evaluation to attain said preselected spatial orientation; and

irradiating said portion of polymerizable composition with visible light for a time sufficient to cause said polymerizable portion to polymerize substantially to hardness, fixedly to maintain said preselected spatial orientation to a high degree of accuracy.

4,443,495
HEAT CURABLE CONDUCTIVE INK

Charles R. Morgan, Brookeville, and Arthur D. Ketley, Chevy Chase, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

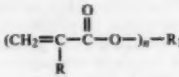
Division of Ser. No. 241,144, Mar. 5, 1981, Pat. No. 4,406,826. This application May 5, 1983, Ser. No. 491,899
Int. Cl.³ B05D *3/06*; H01B *1/02*
U.S. Cl. 427—96 **6 Claims**

1. A process for forming a conductive coating on a substrate which comprises applying in a circuit pattern on a substrate a

solventless screen printable, heat curable conductive ink composition comprising

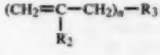
(1) a member of the group consisting of

(a) a polythiol in combination with a liquid, ethylenically, unsaturated monomer, oligomer or prepolymer of the formula:



wherein R is H or CH_3, R_1 is an organic moiety and n is at least 2,

(b) a polythiol in combination with a liquid ethylenically unsaturated monomer, oligomer or prepolymer of the formula:



wherein R_2 is H or CH_3, R_3 is an organic moiety and n is at least 2, and

(c) mixtures of (a) and (b)

(2) a thermal initiator, and (3) A metal as an electrically conductive material in the range of 65–85 weight percent of the conductive ink, and thereafter heating said thus coated substrate at a temperature in the range 80°–200° C.

4,443,496

AGENT AND METHOD FOR MODIFYING SURFACE LAYER OF CEMENT STRUCTURES

Masamichi Obitsu, Chiba; Takahiro Hori, Funabashi; Toyoji Koinuma, Tokyo, and Yuriko Sakaguchi, Funabashi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,820

Claims priority, application Japan, Jul. 30, 1981, 56-119751

Int. Cl.³ C04B *31/00;* **B05C** *1/16;* **B32B** *35/00*

U.S. Cl. 427—140 **13 Claims**

1. A method for modifying a surface layer of cement structures, which comprises steps of applying on surface of the structure an agent comprising 100 parts by weight of an alkali silicate solution and 0.01 to 5 parts by weight of a condensate of sodium naphthalenesulfonate and formaldehyde, in which said alkali silicate solution has a SiO_2/M_2O mole ratio of 1 to 50, wherein M represents an alkali metal atom, or a substituted or unsubstituted ammonium cationic radical, and has a SiO_2 content of 1 to 50 weight %, impregnating the surface layer of said structure with said agent, and then leaving to stand or positively drying the treated structure.

4,443,497

METHOD OF PREPARING MICROCAPSULES

Masayoshi Samejima, Minoh, and Goichi Hirata, Yawata, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Dec. 21, 1981, Ser. No. 333,026

Claims priority, application Japan, Jan. 19, 1981, 56-6859

Int. Cl.³ B01J *13/02*

U.S. Cl. 427—213.36 **10 Claims**

1. A method of preparing microcapsules which comprises:

(i) dissolving a coating polymer material which is selected from the group consisting of (a) water-insoluble, acid-soluble coating polymer material, (b) enteric coating polymer material and (c) amphoteric coating polymer material; and 0.05 to 5 grams of ethylcellulose having an ethoxy content of 44–55 w/w % per gram of said coating polymer material; in a solvent selected from the class consisting of a chlorinated hydrocarbon having one to three carbon atoms, an alkanol having one to four carbon atoms, an alkanone having three to five carbon atoms, a mixture of said alkanol and said alkanone, 2-methoxyethanol, 2-ethoxyethanol, 2-butoxyethanol, dioxane, epihalohydrin, trimethyl phosphate, triethyl phosphate, tetrahydrofuran and diacetone alcohol to form a solution;

(ii) dispersing particles of a pharmaceutically active compound as a core material in said solution to form a dispersion;

(iii) adding an organic liquid which is miscible with said solvent and which is a nonsolvent for said coating polymer material and the pharmaceutically active compound to said dispersion thereby forming coating walls of said coating polymer material on and around said particles of said core material, whereby the ethyl cellulose present minimizes the coagulation of the coating polymer material and/or the adhesion or agglomeration of the thus-formed microcapsules, and then

(iv) recovering the thus-formed microcapsules therefrom.

4,443,498

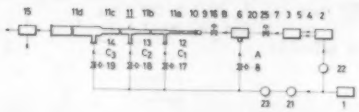
METHOD FOR LINING THE INNER SURFACE OF A REDUCED PIPE LINE

Kiyonori Shinno, Habikino, Japan, assignor to Kabushiki Kaisha Nihon Plant Service Center, Osaka, Japan

Filed Jan. 25, 1983, Ser. No. 460,964

Int. Cl.³ B05D *1/02, 7/22*

U.S. Cl. 427—235 **6 Claims**



1. A method for lining the inner surface of a pipe line with a lining material comprising the steps of: forming a mixture of lining material and compressed air; directing said mixture at a predetermined flow volume rate into a first open end of said pipe line so that said mixture comes in contact with said inner surface of said pipe line and depositing particles of said lining material thereon; adding additional compressed air at predetermined locations along said pipe line to keep the flow volume of said mixture at predetermined values along the length of said pipe line; and removing said mixture from a second open end of said pipe line.

4,443,499

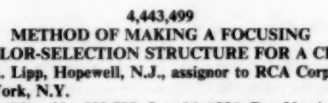
METHOD OF MAKING A FOCUSING COLOR-SELECTION STRUCTURE FOR A CRT

Steven A. Lipp, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 228,588, Jan. 26, 1981, Pat. No. 4,427,918. This application Aug. 4, 1983, Ser. No. 520,213

Int. Cl.³ B05D *1/36, 5/00;* **B44C** *1/22;* **C23F** *1/02*

U.S. Cl. 427—258 **7 Claims**



1. A method for making a quadrupolar focusing color-selection structure for a cathode-ray tube comprising

A. providing a metal plate having two opposed major surfaces,

B. producing in one of said surfaces an array of substantially-parallel ridges of plate metal spaced by valleys therebetween, said ridges having substantially flat tops,

C. removing metal from the other of said surfaces from areas opposite said valleys and extending completely through said plate, thereby producing an array of shaped apertures through said plate,

D. covering by roller coating selected surface portions of the tops of said ridges only with a first coating of electrically-insulating material,

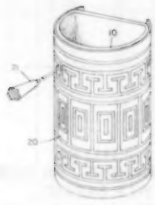
E. and covering selected surface portions of said first coating only with a second coating of electrically-conducting material, said second coating being spaced from said plate.

4,443,500

METHOD FOR FORMING SGRAFFITO PATTERNS ON CERAMIC SURFACES

Charlene K. deJori, 605 Evans, San Antonio, Tex. 78209

Filed Mar. 30, 1982, Ser. No. 363,610
Int. Cl.³ B05D *3/12*
U.S. Cl. 427—264 **6 Claims**



1. A method for forming a design or pattern in a leather hard clay form, comprising the steps of:

applying a binder to the surface of the leather hard clay form, said binder functioning to strengthen said surface and the bond between said surface and a subsequently applied decorative coating, so that upon subsequently removing moisture from the decoratively coated, binder treated clay form, the binder treated form and decorative coating can withstand application and removal of an adhesively backed stencil without damaging the clay form and the decorative coating;

applying said decorative coating to the binder treated surface of the leather hard clay form;

removing the moisture from the clay form by heating the form with artificial heat to a degree sufficient to remove most of the free water;

contacting the decorated clay form with a flexible stencil resistant to erosion by sand blasting with a predetermined design and having an adhesive backing on the stencil to releasably adhere the stencil to the decorated clay form;

sand blasting the decorated clay form through the openings in the stencil to provide the predetermined design on the clay form by removing a predetermined amount of the clay body beneath; and

removing the stencil and firing the clay form to provide a three dimensionally decorated ceramic form.

4,443,501

METHOD FOR FORMING MINIMIZED SPANGLE COATED STRIP

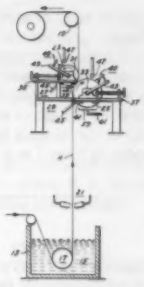
George M. Mino, Hamburg; Donald L. Dustin, Elma, and John H. Williams, Eden, all of N.Y., assignors to Bethlehem Steel Corp., Bethlehem, Pa.

Filed Mar. 1, 1982, Ser. No. 353,716
Int. Cl.³ B05D *3/12*
U.S. Cl. 427—360 **5 Claims**

1. A method of producing galvanized ferrous strip having a minimized spangled coating on the surface thereof, comprising the steps of

(a) passing said strip through a molten galvanizing bath to develop a molten coating layer on the surface of said strip,

(b) contacting at least one coated surface of the strip with a cooled roll to nucleate said layer of the coating and cause rapid crystallization, and



(c) providing a heat transfer liquid between the surface of said roll and the surface of the molten coating layer to provide even contact and heat transfer between the surface of the cooled roll and said coated surface.

4,443,502

LIQUID ORGANOSILOXANE RESIN COMPOSITIONS

Beth I. Gutek, Freeland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Apr. 12, 1983, Ser. No. 484,333
Int. Cl.³ A23P *1/00*
U.S. Cl. 427—387 **25 Claims**

1. A liquid composition comprising

(A) from 5 to 60%, based on the weight of said composition, of at least one solubilized, room temperature curable block copolymer comprising

(1) at least one diorganosiloxane block containing an average of from 15 to 350 repeating units per block, where at least 80 mol % of the units are dimethylsiloxane units, any remaining units being selected from methylphenylsiloxane and methylsiloxane;

(2) at least one block containing at least three repeating units of the formula

$$R_y^1SiO_{\frac{4-y}{2}}$$

where y has a value of from 1 to 1.3 and R^1 represents a monovalent hydrocarbon radical wherein at least 50% of the radicals are phenyl with any remainder being selected from the group consisting of vinyl, methyl, ethyl, and propyl; and

(3) from 3 to 25%, based on the total number of units present in said block copolymer, of terminal units represented by the formula

$$R^2SiY_zO_{\frac{3-z}{2}}$$

where z has an average value of from 1.8 to 2, inclusive, R^2 is alkyl containing from 1 to 6 carbon atoms, phenyl, or vinyl, Y is selected from the group consisting of alkoxy containing from 1 to 5 carbon atoms, acetoxy, and radicals of the formula —ON=Z where Z is

$$R_2^3C= \quad \text{or} \quad \begin{matrix} R^4 \\ \diagdown \\ \diagup \\ C= \end{matrix}$$

where each R^3 contains from 1 to 4 carbon atoms and is

individually selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and R^4 contains from 2 to 5 carbon atoms and is selected from the group consisting of divalent hydrocarbon radicals and halogenated divalent hydrocarbon radicals;

wherein the molar ratio of units in the diorganosiloxane block to $R_y^1SiO_{(4-y/2)}$ units is from 0.7 to 3.5, and units wherein R^1 is phenyl constitute more than about 20 mol % of the total units present in said block copolymer; and

(B) a solvent for said block copolymer, said solvent comprising at least 45% by weight of at least one cyclic polydimethylsiloxane of the formula $[(CH_3)_2SiO]_x$ where x has an average value of from 3 to 8 inclusive.

4,443,503

ANTI-CORROSIVE COATING COMPOSITION AND PROCESS FOR FORMATION OF ANTI-CORROSIVE COATINGS

Minoru Hoshino, Yokohama; Tosio Shinohara, Fujisawa; Hiroyuki Tanabe, Yokohama; Tooru Taki, Yamato, and Shunsuke Nakayama, Yokohama, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Division of Ser. No. 201,606, Oct. 28, 1980, Pat. No. 4,363,889. This application Sep. 2, 1982, Ser. No. 414,458

Claims priority, application Japan, Dec. 19, 1979, 54-165087; Dec. 20, 1979, 54-166205

Int. Cl.³ B05D *1/02, 7/14*

U.S. Cl. 427—421 **8 Claims**

1. A process for forming an anti-corrosive coating on an iron or a steel substrate, which comprises mixing

(i) 100 parts by weight of an unsaturated polyester resin containing an α,β-ethylenically unsaturated monomer,

(ii) 10 to 70 parts by weight of glass flake having an average particle size of 100 to 400 microns and an average thickness of 0.5 to 5 microns,

(iii) 10 to 150 parts by weight of a scaly metal pigment having particle size between 30–300 microns;

(iv) 0.3 to 1.5 parts by weight of curing promoter,

then adding a member selected from the group consisting of (a) a mixture of 0.1 to 1.0 part by weight of a ketone peroxide and 0.5 to 2.0 parts by weight of a hydroperoxide, (b) a mixture of 0.1 to 1 part by weight of a ketone peroxide and 0.5 to 2 parts by weight of a peroxy ester and (c) a mixture of 0.1 to 1.0 parts by weight of a ketone peroxide, 0.5 to 2 parts by weight of said hydroperoxide and said peroxy ester, and spray coating to a coating thickness of 300 to 1500 microns, by using a spray gun having a spray tip diameter of 0.5 to 3 mm.

4,443,504

COATING METHOD

Richard S. Burket, Brevard; Brian F. Conaghan, and Robert I. Hirshburg, both of Hendersonville, all of N.C., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jun. 9, 1982, Ser. No. 386,679

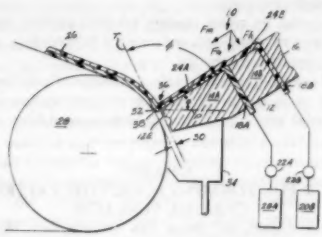
Int. Cl.³ B05C *5/02*

U.S. Cl. 427—445 **4 Claims**

1. A method of coating a moving web carried by a coating roll using a slide surface along which a coating fluid flows by gravity toward an impingement point on the web, the slide surface defining an angle with respect to a horizontal datum plane, comprising the steps of:

(a) adjusting the angle between the slide and the datum plane to a predetermined angle in a range from 35° to 50°;

(b) locating the coating fluid impingement point above the center line of the coating roll such that a tangent to the coating roll at the impingement point defines a takeoff



angle with respect to the slide surface at a predetermined angle in the range from 85° to 100°; and

(c) introducing a coating fluid onto the slide.

4,443,505

EMBOSSING PILE FABRICS AND EMBOSSED LOOP PILE FABRIC

Frank E. Ehrenfeld, Jr., Morrisville, Pa., assignor to Congoleum Corporation, Kearny, N.J.

Continuation-in-part of Ser. No. 367,211, Apr. 9, 1982, and a continuation of Ser. No. 150,575, May 16, 1980, which is a continuation of Ser. No. 806,787, Jun. 15, 1977, abandoned, which is a continuation of Ser. No. 632,446, Nov. 17, 1975, abandoned, which is a continuation of Ser. No. 437,782, Jan. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 267,227, Jun. 28, 1972, abandoned, which is a continuation of Ser. No. 64,475, Aug. 17, 1970, abandoned, said Ser. No. 367,211, is a continuation of Ser. No. 15,297, Feb. 26, 1979, Pat. No. 4,340,381, which is a continuation-in-part of Ser. No. 616,307, Sep. 24, 1975, abandoned, which is a continuation of Ser. No. 492,011, Jul. 26, 1974, abandoned, which is a continuation of Ser. No. 267,227,. This application Sep. 29, 1982, Ser. No. 428,375

Int. Cl.³ B32B *3/02*

U.S. Cl. 428—89 **10 Claims**

1. A process for providing an embossed effect on nylon pile fabric having a surface of upstanding nylon fibers that comprises

applying to defined areas of the pile fabric an embossing composition

applying over said embossing composition a composition to displace said embossing composition toward the base of said fibers

allowing said embossing composition to remain in contact with said fibers for a period of time and at a temperature sufficient to reduce the height of the pile only in the areas contacted by the embossing composition, without deterioration of the fibers,

said reduction being sufficient to display a significant embossed effect in the overall fabric.

4,443,506

BULLETPROOF ARRANGEMENT OF WOVEN, KNITTED OR THE LIKE FABRICS

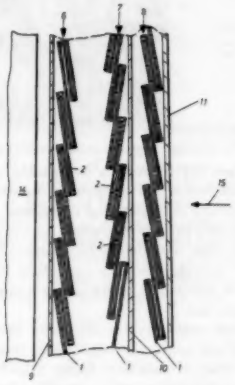
Horst Schmolmann, and Renate Schmolmann nee Holstein, both of Friedrichsholm, Fed. Rep. of Germany, assignors to Interglas-Textil GmbH., Ulm, Fed. Rep. of Germany

Filed Dec. 17, 1982, Ser. No. 450,578

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150725

Int. Cl.³ B32B *3/04, 3/26*

U.S. Cl. 428—102 14 Claims



1. A bulletproof arrangement of woven or knitted fabric material comprised of aromatic polyamide fibers, comprising:

(a) at least one continuous web of said fabric material;

(b) said web being folded at spaced intervals in a zigzag configuration forming a succession of panels, each panel comprising three layers of said web and having a first fold line between the first and second layers of said web and a second fold line between the second and third layers of said web;

(c) said third layer of said web in one panel extending to form the first layer of said web of the next succeeding panel;

(d) the distance between the second fold line of one panel and the first fold line of the next succeeding panel being greater than, but less than twice, the distance between the first and second fold lines of said panels such that said panels partially overlap; and

(e) the distance between the first fold line of one panel and the second fold line of the panel next succeeding the next succeeding panel being less than the caliber of a projectile impacting upon the bulletproof arrangement.

4,443,507

HEAT-MOLDABLE LAMINATE AND PROCESS FOR MOLDING SAID LAMINATED STRUCTURES

Kozo Yamada, and Takayuki Tanaka, both of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd., Tokyo, Japan

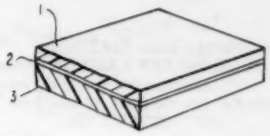
Continuation-in-part of Ser. No. 115,851, Jan. 28, 1980, abandoned. This application Aug. 30, 1982, Ser. No. 413,117

Claims priority, application Japan, Jan. 26, 1979, 54-7228; Jul. 30, 1980, 55-100155

Int. Cl.³ B32B *7/00, 27/00*

U.S. Cl. 428—114 26 Claims

1. A heat-moldable laminate comprising at least one thermoplastic resin layer, at least one fiber reinforced cured thermosetting resin layer about 0.02 to 5 mm thick, and at least one slippage layer about 0.02 to 1 mm thick interposed between the resin layers, wherein the slippage layer comprises a thermoplastic resin and is capable of being in the molten state at lower temperatures than the moldable temperature of the thermoplastic resin, said slippage layer permitting slippage between said resin layers, said thermoplastic resin layer having a thickness that provides sufficient ridigity capable of preventing the fiber reinforced cured thermosetting resin layer from resuming



its original form through internal stress of the reinforced cured thermosetting resin layer when it is deformed by exterior applied forces upon molding the laminate.

4,443,508

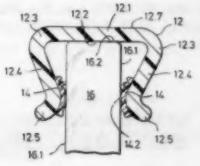
EDGE PROTECTOR

Donald N. Mehl, Minnetonka, Minn., assignor to Norfab, Inc., Minneapolis, Minn.

Filed Sep. 30, 1982, Ser. No. 431,617

Int. Cl.³ B60R *13/04;* B32B *3/04*

U.S. Cl. 428—122 5 Claims



1. An edge protector for a sheet of glass or the like comprising an integral, dual-durometer, co-extruded channel having rigid and soft portions, the rigid portion comprising a channel having an internally generally flat central portion and legs extending convergently from edges of the central portion and terminating in reversely curved, divergent edge portions providing confronting oppositely curved surfaces spaced from the central portion, the soft portion comprising deformable gripping pads formed integrally by co-extrusion on said confronting surfaces and providing confronting, deformable gripping surfaces for conformably gripping therebetween, with surface-to-surface contact, exterior parallel surfaces of a glass sheet or the like adjacent the edge of the sheet with the latter receivable in confronting relationship to the internally generally flat central portion of the protector.

4,443,509

INSULATION AND THE PROVISION THEREOF

Robert A. Sauder, Emporia, Kans., assignor to Sauder Industries, Inc., Emporia, Kans.

Filed Jan. 21, 1982, Ser. No. 341,255

Int. Cl.³ B32B *3/10*

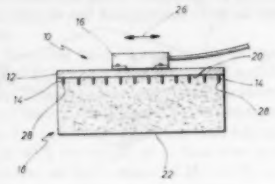
U.S. Cl. 428—137 52 Claims

1. A method of forming an insulation member for insulating the walls of a furnace, the method comprising:

(a) providing holes at spaced intervals in a cold face of a mat

of fibrous insulation material, which cold face is to be directed towards a furnace wall during use;

(b) applying a liquid adhesive to the cold face; and



(c) vibrating the adhesive to cause adhesive penetration into the holes of the mat.

4,443,510

CONFORMABLE REMOVABLE REFLECTIVE MARKING TAPE

Charles W. Watt, Webster Groves, Mo., assignor to Lukens General Industries, Inc., St. Louis, Mo.

Filed Sep. 23, 1982, Ser. No. 421,871
Int. Cl.³ B32B 5/02; G02B 5/136
U.S. Cl. 428—149 **2 Claims**

1. A thin conformable, removable, reflective marking tape comprising:

a base layer of zero temper aluminum foil approximately 0.0025 to 0.0035 inches thick;

a layer of vinyl pigmented binder on the top surface of said foil;

glass beads, 30–80 U.S. standard mesh, (0.0234 to 0.0070 inches in diameter), having an index of refraction ranging approximately from 1.90 to 1.94, embedded in said binder;

a scrim layer of resilient nylon felt on the bottom surface of said foil;

a pressure sensitive adhesive layer on the bottom surface of said scrim;

said scrim being bonded to said foil by the application of the adhesive to the bottom of the said foil, and said scrim being saturated by said adhesive;

said nylon scrim having a memory tending to return the scrim to its original dimensions when stretched to conform to a surface;

said nylon scrim further being sufficiently thin such that flexing of the aluminum base layer is minimized to prolong the life of the vinyl pigmented binder and glass beads on the top surface thereof;

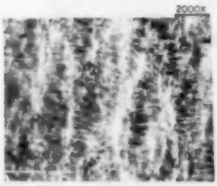
said aluminum layer being sufficiently thin to conform to the roadway surface, but thick enough to override the memory of the nylon scrim, the marking tape, thereby, having substantially no memory and forming a tight, removable, surface conforming structure when applied to a roadway or the like.

4,443,511

ELASTOMERIC WATERPROOF LAMINATE

Dexter Worden; Frederic T. Wilson, both of Newark, Del., and Linda J. Grubb, Elkton, Md., assignors to W. L. Gore & Associates, Inc., Newark, Del.

Filed Nov. 19, 1982, Ser. No. 443,137
Int. Cl.³ B32B 7/14
U.S. Cl. 428—198 **18 Claims**



1. A process for forming a stretchable composite article having at least two layers comprising the steps of:

(i) mechanically stretching the composite to impart stretch and recovery properties thereto, said layers comprising:

(a) a first layer of hydrophobic material having a moisture vapor transmission rate exceeding 1000 gma/m² day and an advancing water contact angle exceeding 90 degrees; and

(b) an elastomeric hydrophilic layer having a major portion of one surface in interlocking relationship with the inner face of said first layer, said hydrophilic layer having moisture vapor transmission rate exceeding 1000 gms/m² day, the stretching step extending the first layer in one direction at least 5% beyond its yield point; and

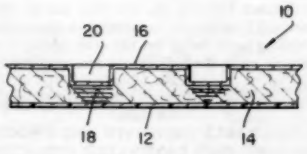
(ii) relaxing the stretched composite.

4,443,512

ABSORBENT ARTICLE WITH DENSIFIED AREAS

Myriam Delvaux, Hannut, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Sep. 22, 1981, Ser. No. 304,489
Int. Cl.³ A61F 13/16; B32B 5/12
U.S. Cl. 428—162 **1 Claim**



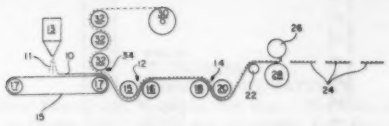
1. An absorbent article comprising a backing sheet, an absorbent pad on said backing sheet, and a top sheet overlying said pad, said pad being of an absorbent material, said absorbent article being embossed compressing said pad so that separate discrete compressed areas are formed with the balance of the pad being substantially non-compressed, said pad when embossed including discrete areas of highly compressed absorbent material and other areas of substantially non-compressed absorbent material, said discrete areas and said other areas having the same amount of absorbent material per unit of size, said discrete areas being of 0.13 square centimeters in size, said discrete areas being spaced apart 0.32 centimeters and the density of said absorbent material in said densified areas being 0.22 grams per centimeter.

4,443,513

SOFT THERMOPLASTIC FIBER WEBS AND METHOD OF MAKING

Gary H. Meitner, Winnebago County, Wis., and Patrick J. Notheis, Cobb County, Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 24, 1982, Ser. No. 351,829
Int. Cl.³ B32B 3/00
U.S. Cl. 422—195 20 Claims



1. Nonwoven web comprising thermoplastic staple length or longer fibers or filaments containing a pattern of fused bond areas over about 9 to 35% of the web surface separated by areas of substantially unbonded fibers or filaments extending out of the plane of the fused bonds wherein said web is extended to up to about 140% of its original dimension in at least one direction resulting in increased bulk and improved softness and an improvement in effective capacity of at least 35% with an increase in pores in excess of 40 microns of at least about 10% when compared with the unextended web.

4,443,514

MAGNETIC RECORDING MEDIUM

Nobuyuki Yamamoto, Shizuoka; Yasuo Nishikawa; Yuji Andou, both of Kanagawa; Kyoichi Naruo, and Tsutomu Okita, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 10, 1982, Ser. No. 347,618
Claims priority, application Japan, Feb. 10, 1981, 56-18508
Int. Cl.³ G11B 5/72
U.S. Cl. 428—216 14 Claims

1. A magnetic recording medium, comprising:
a non-magnetic support base;
a thin magnetic metal film formed on a surface of said non-magnetic support base; and
a thin film containing in at least 70 weight percent a copolymer material formed on said thin magnetic metal film, said copolymer material containing 50% or more vinylidene chloride and 10% or more acrylonitrile as repeating units.

4,443,515

ANTISTATIC FABRICS INCORPORATING SPECIALTY TEXTILE FIBERS HAVING HIGH MOISTURE REGAIN AND ARTICLES PRODUCED THEREFROM

Sheldon M. Atlas, New York, N.Y., assignor to Peter Rosenwald, New York, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,514
Claims priority, application France, Feb. 5, 1982, 82 01861; Aug. 20, 1982, 82 14409
Int. Cl.³ D03D 25/00
U.S. Cl. 428—224 17 Claims

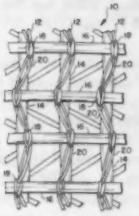
1. A textile fabric which is resistant to accumulation of static charge, said fabric comprising at least one percent by weight of interlocked hydrophilic fibers which are capable of absorbing up to about 50% by weight of the fiber of moisture without lose of mechanical strength and other textile properties, said hydrophilic fibers having a Rockwell hardness in the range of from about 40 to about 60 and consisting of a linear hygroscopic homopolymer of a monomer selected from the group consisting of alpha, beta-ethylenically unsaturated carboxylic acids, alpha, beta-ethylenically unsaturated sulfonic acids, hydroxyalkyl esters of these acids and hydroxyglycidyl esters of these acids, said polymers having a molecular weight in the range of from about 100,000 to about 500,000, a softening point in the range of from about 210° C. to about 245° C. and a glass transition temperature Tg above about 115° C., and said polymer being cross-linked at a cross-linking density in the range of one chemical cross-link bond per from about 40 to about 100 repeating monomeric units of said polymer.

4,443,516

WARP KNIT SIGN FABRIC

Jack S. Rogers, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 27, 1983, Ser. No. 508,020
Int. Cl.³ B32B 7/00
U.S. Cl. 428—253 6 Claims



1. A fabric for use as the structural material for outdoor signs comprising: a warp knit, weft inserted substrate material and a sheet of PVC film material laminated to both sides of said substrate, said substrate being a two-bar fabric with a fill yarn inserted in every other course of said fabric, said two-bar fabric having a design represented by a front bar movement of 1-0/0-1/1-2/2-1 and a back bar movement of 1-1/1-1/0-0/0-0.

4,443,517

GASKETING MATERIAL

Kanu G. Shah, Arlington Heights, Ill., assignor to Dana Corporation, Toledo, Ohio

Filed May 5, 1982, Ser. No. 374,995
Int. Cl.³ D04H 1/08
U.S. Cl. 428—281 22 Claims

1. A fibrous material comprising:
(a) a sheet of paper-like material ranging in thickness from 0.020 to 0.070 inch, and composed of a felted mass of intermeshed fibers bonded to one-another at points of contact by a binder; and
(b) flake graphite distributed throughout the intermeshed fibers, wherein the fibers and the graphite are uniformly distributed through the sheet and the graphite constitutes from about 45% to 95% of the material based upon the weight of the fibers, the binder and the graphite.

4,443,518

BONDED REINFORCED PLASTIC STRUCTURES

Joseph G. Martins, Ludlow; Donald D. Donermeyer, and David A. Fabel, both of Springfield, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 4, 1983, Ser. No. 464,080
Int. Cl.³ B32B 27/08; C09J 5/02
U.S. Cl. 428—336 16 Claims

1. A bonded reinforced plastic structure which comprises reinforced plastic parts coated with a primer coat and bonded together by a thermoplastic block copolymer wherein the reinforced plastic is formed from sheet molding compound or bulk molding compound, wherein the primer coat comprises a moisture-curable polyisocyanate, wherein the block copolymer comprises from 40 to 80% by weight of crystalline polyester or polyamide segments and from 20 to 60% by weight of amorphous polyamide or polyether segments, and wherein the block copolymer has a crystalline melting point above about

155° C. and a number average molecular weight in the range of about 8000 to about 30000.

2. The bonded structure of claim 1 wherein the primer coating thickness is in the range of 5 to about 25 microns.

4,443,519

BONDED PLASTIC STRUCTURES

Donald D. Donermeyer, Springfield; Joseph G. Martins, Ludlow, and David A. Fabel, Springfield, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 4, 1983, Ser. No. 464,082
Int. Cl.³ B32B *27/08, 27/34, 27/40;* C09J *5/02*
U.S. Cl. 428—336 **15 Claims**

1. A bonded plastic structure which comprises plastic parts coated with a primer coat and bonded together by a thermoplastic block copolymer wherein the plastic is a reinforced reaction injection molded polyurethane or a reaction injection molded nylon, wherein the primer coat comprises a moisture-curable polyisocyanate, wherein the block copolymer comprises from 40 to 80% by weight of crystalline polyester or polyamide segments and from 20 to 60% by weight of amorphous polyamide or polyether segments, and wherein the block copolymer has a crystalline melting point above about 155° C. and a number average molecular weight in the range of about 8000 to about 30,000.

2. The bonded structure of claim 1 wherein the primer coating thickness is in the range of about 5 to about 25 microns.

4,443,520

FIREPROOF COATING FOR WOOD OF THERMOPLASTIC RESIN, ALUMINA TRIHYDRATE AND GLASS FIBERS

Charles H. Braithwaite, Jr., 11232 Tigrina, Whittier, Calif. 90603

Filed Sep. 29, 1982, Ser. No. 426,629
Int. Cl.³ B32B *3/26*
U.S. Cl. 428—438 **14 Claims**

1. The method of treating a wood product which comprises:

(a) coating at least one surface of said wood product with a suspension of:

(i) ambient temperature film former ingredients selected from the class of latexes of polyvinyl acetate, polyacrylates, styrene-butadiene polymers and halogenated derivatives thereof, and copolymers thereof, and

(ii) high temperature barrier forming ingredients including from 26 to 30 weight percent of alumina trihydrate, and from 2 to 10 weight percent of glass fibers;

(b) drying said coating at a temperature from ambient to about 275 degrees F. for a time sufficient to remove water therefrom and form a dry coating without dehydration of said alumina trihydrate.

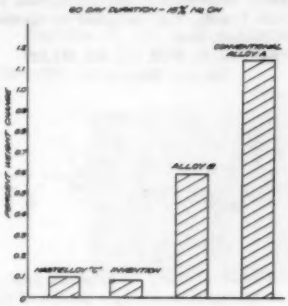
4,443,521

COATING ALLOY

Burton A. Kushner, Old Bethpage, and Michael J. Jirinec, New Hyde Park, both of N.Y., assignors to Eutectic Corporation, Flushing, N.Y.

Division of Ser. No. 323,390, Nov. 20, 1981. This application Sep. 8, 1982, Ser. No. 416,009
The portion of the term of this patent subsequent to Nov. 30, 1999, has been disclaimed.
Int. Cl.³ C22C *19/03*
U.S. Cl. 428—679 **4 Claims**

1. A metal substrate having bonded thereto a flame-sprayed coating formed of an alloy consisting essentially by weight of up to about 0.1% C, about 3% to 30% Mo, up to about 3% Si,



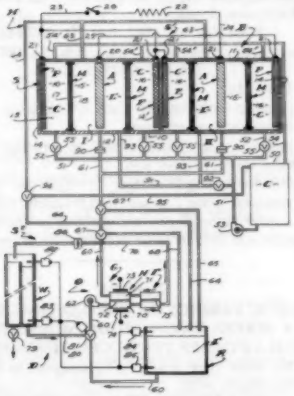
up to about 6% W, about 2.5% to 12% Ti, about 10% to 22% Fe, up to about 0.4% V, and the balance essentially nickel.

4,443,522

METAL/ACID ION PERMEABLE MEMBRANE FUEL CELL

Ralph C. Struthers, 39503 Calle El Fuente, Saugus, Calif. 91350

Division of Ser. No. 251,488, Apr. 6, 1981, Pat. No. 4,352,864. This application May 17, 1982, Ser. No. 378,857
Int. Cl.³ H01M *8/24*
U.S. Cl. 429—18 **9 Claims**



1. A battery comprising a plurality of related fuel cells including an elongate fluid receiving chamber in a case, spaced apart ion permeable membranes in and dividing the chamber to define adjacent cathode and anode compartments and establishing acid-base interfaces between the compartments, anode plates in the anode compartments, with terminals projecting from the case, electron distributor plates in the cathode compartments with terminals projecting from the case, an electric circuit with lines connected with said terminals and connecting the plurality of cells in series, a supply of acid cathode solution, cathode solution delivery means conducting cathode solution from the supply of cathode solution into the cathode compartments, a supply of base electrolyte solution and electrolyte solution delivery means conducting electrolyte solution into and out of the anode compartments and including electrolyte conducting lines communicating with the anode compartments and ion filter means in those lines stopping the movement of

ions through the electrolyte in the lines from one anode compartment to another.

4,443,523

HIGH-TEMPERATURE BATTERY

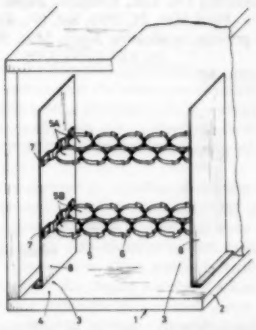
Dieter Hasennauer, Weinheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,969

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118693

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—99 **5 Claims**



1. High-temperature battery comprising

(a) a thermal insulation housing enclosing a mounting for clamping storage cells in the interior of the thermal insulation,

(b) said mounting having a plurality of clamping elements in an upper horizontal plane with each clamping element connected to the adjoining clamping element,

(c) a second plurality of clamping elements in a lower horizontal plane with each clamping element connected to the adjoining clamping element, spaced below the clamping elements in the upper horizontal plane,

(d) each horizontal plane having at least two rows of clamping elements with each row of the same length and the rows arranged by the clamping elements of the same size lined up in pairs,

(e) each pair of clamping elements in the lower plane arranged perpendicularly below one pair of clamping elements in the upper plane,

(f) each clamping element in both planes formed as a clamping ring with at least one outward pointed clamping eye to permit insertion and removal of individual storage cells and a self-supported clamping of each individual storage cell by an upper clamping element and an aligned lower clamping element,

(g) said mounting also having supports for the two planes of clamping elements with at least one support arranged at each lateral end of the mounting, and

(h) wherein the last pair of clamping elements at the first and the second lateral end of each plane is connected with the said support.

4,443,524

HIGH-TEMPERATURE BATTERY

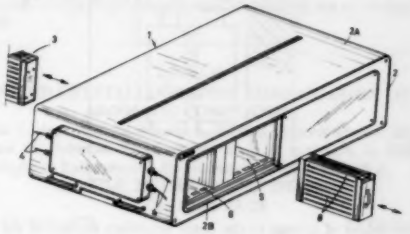
Henner Meinhold, Sandhausen, and Dieter Hasenauer, Weinheim, both of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,967

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119409

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—99 **9 Claims**



1. High-temperature battery comprising a thermal insulation housing for enclosing electrochemical storage cells, at least one housing air inlet for feeding cooling air into the interior of the housing, and at least one housing air outlet for the discharge of said air from the housing, at least one module containing electrochemical storage cells for insertion into the interior of said housing, said module having at least one feedline for the flow of cooling air in the housing into said module against the force of gravity and at least one discharge passage, through which the air leaves said module with the force of gravity, said feedline arranged at a first lateral end and the discharge passage arranged at a second other lateral end of the module, said feedline and said discharge passage have an inlet opening and an outlet opening respectively, in the lower region of the lateral ends of the module, said feedline and said discharge passage are in connection with the interior of the module containing the storage cells only via a respective connecting opening in the upper region of the module, said storage cells in the module arranged to provide empty spaces between them for the cooling air conducted in the interior of the module to flow through these spaces along the length of each storage cell, and empty spaces as passageways between the storage cells and the inner boundary surface of the module are provided for passage of cooling air in the module.

4,443,525

HIGH-TEMPERATURE BATTERY

Dieter Hasenauer, Weinheim, Fed. Rep. of Germany, assignor to Brown, Boveri & CIE AG, Mannheim, Fed. Rep. of Germany

Filed May 7, 1982, Ser. No. 375,968

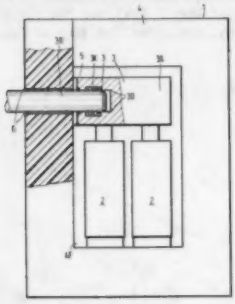
Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118692

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—102 **6 Claims**

1. High-temperature battery comprising a housing of thermal insulation enclosing a cavity in the thermal insulation housing, at least one electrochemical storage cell of alkali metal and chalcogen electrodes disposed in said cavity, with at least one electric conductor passing through a feedthrough in the thermal insulation with one first end of the electric conductor connected to the electrochemical storage cell in the cavity, and with the other second end of said electric conductor extending outside the high-temperature battery, said electric conductor composed of at least two subconductors detachably connected to each other, said first subconductor with said first end of the conductor connected to the storage cell in an electrically conducting manner disposed in the high temperature battery, said feedthrough formed as a canal in the thermal

insulation and said second subconductor pushed through the canal and snapped into a contact element sitting in a hole of the first subconductor, wherein the second subconductor is removable from the contact element of the first subconductor to



an extent of at least to the outer boundary surface of the thermal insulation permitting the canal in the insulation vacated by removal of the second subconductor to be filled with air, which air is a poor conductor of heat and retards heat loss during pauses in the operation of the high-temperature battery.

4,443,526

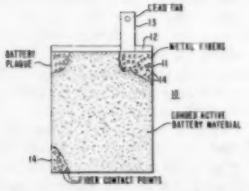
$NICO_3$ ELECTRODE MATERIAL AND ELECTRODE

John F. Jackovitz, Monroeville; Joseph Seidel, and Earl A. Pantier, both of Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 3, 1982, Ser. No. 354,489

Int. Cl.³ H01M *4/32*

U.S. Cl. 429—223 **8 Claims**



1. An electrode paste consisting essentially of the admixture of:

(A) anhydrous nickel carbonate,

(B) up to about 50 wt.% of nickel hydroxide, based on anhydrous nickel carbonate weight,

(C) a cobalt additive compound, and

(D) sufficient water to form a paste.

4,443,527

COLORED MAGNETICALLY ATTRACTABLE TONER POWDER, ITS PREPARATION, AND DEVELOPING IMAGES WITH SUCH POWDER

Harm H. Heikens, Reuver, and Gerardus J. Crommentuyn, Lottum, both of Netherlands, assignors to Océ-Nederland B.V., Venlo, Netherlands

Filed Sep. 2, 1982, Ser. No. 414,501

Claims priority, application Netherlands, Sep. 18, 1981, 8104307

Int. Cl.³ G03G *9/08, 9/14*

U.S. Cl. 430—39 **25 Claims**

1. A colored magnetically attractable toner powder the particles of which individually comprise a magnetically attractable core of between about 8 and about 35 μm in size consisting essentially of particulate magnetically attractable material substantially completely enveloped in binder, a masking layer enveloping said core, said layer consisting essentially of reflecting pigment of sub-micron particle size distributed substantially homogeneously in binder and applied in an amount sufficient to mask off substantially completely the color of said magnetically attractable material, and coloring material in and/or on the masking layer.

20. A process for developing into a colored powder image a latent electrostatic or magnetic information pattern, which comprises depositing onto said pattern particles of a toner powder according to claim **1**, **12**, or **19**.

4,443,528

PHOTOCONDUCTIVE MATERIALS COMPRISING NITRO OR CYANO SUBSTITUTED PHTHALOCYANINE COMPOUNDS FOR ELECTROPHOTOGRAPHY

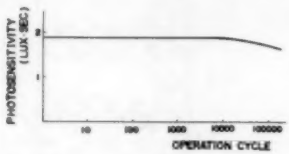
Shinichi Tamura; Toshio Seta; Tsuneo Tanaka, and Mititika Hikosaka, all of Kyobashi, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Kyobashi, Japan

Filed Mar. 21, 1983, Ser. No. 476,979

Claims priority, application Japan, Mar. 29, 1982, 57-49025

Int. Cl.³ G03G *5/06*

U.S. Cl. 430—56 **21 Claims**



1. A photoconductive material comprising a phthalocyanine and a phthalocyanine derivative in which the phthalocyanine molecule has benzene nuclei substituted with at least one member selected from nitro groups and cyano groups.

4,443,529

PHOTOCONDUCTIVE MEMBER HAVING AN AMORPHOUS SILICON PHOTOCONDUCTOR AND A DOUBLE-LAYER BARRIER LAYER

Junichiro Kanbe, Yokohama; Shigeru Shirai, Yamato, and Tadaji Fukuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,368

Claims priority, application Japan, Apr. 24, 1981, 56-62182

Int. Cl.³ G03G *5/04, 5/082*

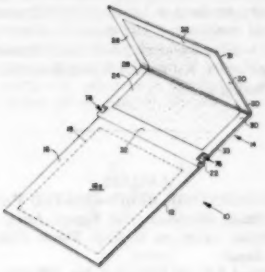
U.S. Cl. 430—65 **24 Claims**

1. A photoconductive member comprising a support for photoconductive member, a photoconductive layer constituted of an amorphous material comprising silicon atom as a matrix and a barrier layer between said support and said photoconductive layer, said barrier layer having a double-layer structure layered from the side of said support of a first barrier layer comprising an amorphous silicon material containing (i) hydrogen or halogen and (ii) impurities wherein (i) and (ii) are in amounts sufficient to impede the injection of free carriers from the support and a second barrier layer constituted of an electrically insulating material different from said amorphous material constituting said first barrier layer.

4,443,530
SELF-PROCESSING FILM UNIT WITH LIQUID APPLICATOR

David V. Cronin, Peabody, and Vincent L. Cocco, Wakefield, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 22, 1982, Ser. No. 436,189
Int. Cl.³ G03C 5/54, 1/48; G03D 9/00, 5/00
U.S. Cl. 430—138 39 Claims



31. A self-processing film unit comprising:

a sheet-like film component including one or more photosensitive layers and having an outer surface with a given area thereof that is configured to be wetted with a low viscosity processing liquid to initiate processing of said film component; and

a liquid applicator secured to said film component outside of said given area and including a liquid and air impervious sheet dimensioned for extension over said outer surface in covering relation to said given area, and means on one surface of said impervious sheet yieldably holding a substantially uniformly distributed supply of a low viscosity processing liquid sufficient to wet said given area, said applicator being initially provided on said film component in a folded and releasably sealed configuration, wherein said impervious sheet is folded over on itself and is releasably sealed along facing marginal portions thereof to form a liquid and air impervious enclosure about said liquid holding means, and being configured for movement to an unsealed extended configuration overlying said outer surface with said liquid holding means in liquid yielding contact with said given area to effect wetting thereof.

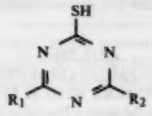
39. The film unit of claim 31 wherein said liquid holding means includes a plurality of microcapsules, each enclosing a quantity of said liquid processing composition and being rupturable to release said liquid to effect wetting of said given area.

4,443,531
DELETING AGENTS FOR PRINTING PLATES AND METHOD FOR DELETION

Shoji Yamada; Eiji Kanada, and Eiji Mathubara, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 424,300
Claims priority, application Japan, Dec. 18, 1981, 56-203595; Jul. 8, 1982, 57-119026
Int. Cl.³ G03F 7/00
U.S. Cl. 430—204 7 Claims

1. A method for deleting images formed on offset printing plates which comprises treating the surface of undesired portion of the images formed by exposure and development with a deletion fluid which contains an S-triazine compound represented by the following general formula:



wherein R_1 and R_2 represent —SH or —OH and when either one of R_1 or R_2 is —SH, the other may be NHR wherein R is H or —R'—COOH wherein R' is an alkylene group or arylene group.

4,443,532
INDUCED CRYSTALLOGRAPHIC MODIFICATION OF AROMATIC COMPOUNDS

David C. Joy, Warren; Martin L. Kaplan, Morris Plains, and Paul H. Schmidt, Chatham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 29, 1981, Ser. No. 288,002
Int. Cl.³ H01L 29/28
U.S. Cl. 430—270 13 Claims

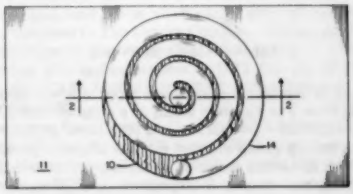
1. An exposed energy-sensitive body comprising an energy-sensitive material that has been exposed and that contacts a substrate characterized in that said energy-sensitive material comprises a composition chosen from the group consisting of 1,4,5,8-naphthalene tetracarboxylic dianhydride, 3,4,9,10-perylene tetracarboxylic dianhydride, 3,4,9,10-perylene tetracarboxylic diimide and combinations thereof, wherein at least a portion of said composition has undergone a crystal structure change upon treatment with said energy.

9. The process comprising the steps of exposing an energy-sensitive body to energy wherein said energy-sensitive body comprises an energy-sensitive material contacting a substrate characterized in that said energy-sensitive material comprises a composition chosen from the group consisting of 1,4,5,8-naphthalene tetracarboxylic dianhydride, 3,4,9,10-perylene tetracarboxylic dianhydride, 3,4,9,10-perylene tetracarboxylic diimide, and combinations thereof, whereby said composition undergoes a crystal structure change upon treatment with said energy.

4,443,533
PHOTORESIST CURING METHOD

C. Richard Panico, 21 Leighton St., Medford, Mass. 02155

Filed Jul. 23, 1982, Ser. No. 401,318
Int. Cl.³ G03C 5/16
U.S. Cl. 430—311 6 Claims



1. In a method of forming optically delineated circuits comprising applying a photoresist to a substrate; exposing said photoresist to a photoexposure of a circuit pattern; developing said photoresist by washing away the unexposed portions; curing the remaining photoresist; and treating the exposed substrate surface to provide electrical circuits, the combination of step to produce said curing comprising:

(a) positioning said substrate so that the surface of the remaining photoresist is spaced in the range of 6.0 mm to 6.0 cm from the envelope of a flash arc lamp; and,

(b) discharging at least one electrical pulse through said

lamp with a current density in said lamp in the range of 400 to 2000 amperes per square centimeter.

4,443,534

SILVER HALIDE PHOTOGRAPHIC ELEMENTS CONTAINING POLYMERS WHICH FILTER UV LIGHT

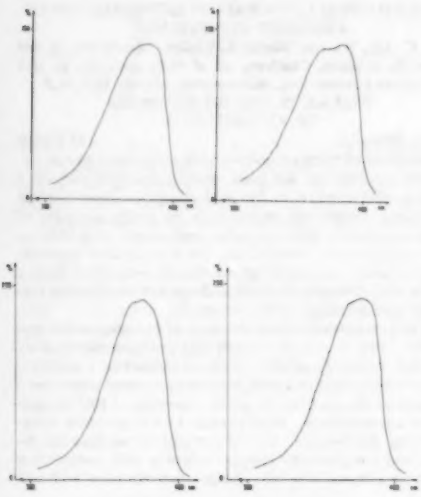
Tetsuro Kojima; Shingo Ishimaru; Naohiko Sugimoto, and Tadashi Ikeda, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 12, 1983, Ser. No. 484,331

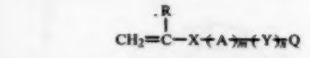
Claims priority, application Japan, Apr. 14, 1982, 57-61937

Int. Cl.³ G03C *1/84*

U.S. Cl. 430—512 **23 Claims**

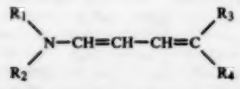


1. A silver halide photographic light-sensitive material comprising a support having thereon at least one light-sensitive silver halide emulsion layer and at least one light-insensitive layer, the photographic light-sensitive material containing an ultraviolet ray absorbing polymer latex which comprises a homopolymer or a copolymer having a repeating unit derived from a monomer represented by the following general formula (I):



(I)

wherein R represents a hydrogen atom, a lower alkyl group having from 1 to 4 carbon atoms or a chlorine atom; X represents —CONH—, —COO— or a phenylene group; A represents a linking group selected from an alkylene group having from 1 to 20 carbon atoms or an arylene group having from 6 to 20 carbon atoms; Y represents —COO—, —OCO—, —CONH—, —NHCO—, —SO_2NH—, —NHSO_2—, —SO_2— or —O—; m represents 0 or an integer of 1; n represents 0 or an integer of 1; and Q represents an ultraviolet ray absorbing group represented by the following general formula (II):



(II)

wherein R_1 and R_2, which may be the same or different, each represents a hydrogen atom, an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms, provided that the both of R_1 and R_2 do not simultaneously represent hydrogen atoms, and further R_1 and R_2 may combine to form an atomic group necessary to form a cyclic amino group; R_3 represents a cyano group, —$COOR_5$, —$CONHR_5$, —COR_5 or —SO_2R_5; and R_4 represents a cyano group, —$COOR_6$, —$CONHR_6$, —COR_6 or —SO_2R_6; wherein R_5 and R_6 each represents an alkyl group having from 1 to 20 carbon atoms or an aryl group having from 6 to 20 carbon atoms, and further R_5 and R_6 may combine to form an atomic group necessary to form a 1,3-dioxocyclohexane nucleus, a barbituric acid nucleus, a 1,2-diaza-3,5-dioxocyclopentane nucleus or a 2,4-diaza-1-alkoxy-3,5-dioxocyclohexene nucleus; and at least one of R_1, R_2, R_3 and R_4 bonds to the vinyl group through the linking group.

4,443,535

PHOTOGRAPHIC RESIN-COATED PAPER

Masataka Kiritani, Shizuoka, and Yasuzi Asao, Fujinomiya, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 16, 1982, Ser. No. 398,826

Claims priority, application Japan, Jul. 21, 1981, 56-114181

Int. Cl.³ G03C *1/76, 1/86, 3/00*

U.S. Cl. 430—538 **10 Claims**

1. In a photographic resin-coated paper comprising a polyolefin resin layer containing titanium dioxide powder therein and having embossed pattern on the surface, the improvement comprises employment of titanium dioxide powder coated with an alcohol having 2–18 carbon atoms and 3 methylol groups as the titanium dioxide powder.

4,443,536

NONDIFFUSIBLE PHOTOGRAPHIC COUPLERS AND PHOTOGRAPHIC ELEMENTS AND PROCESSES EMPLOYING SAME

Gregory J. Lestina, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 296,086, Aug. 26, 1981, abandoned. This application Apr. 8, 1982, Ser. No. 366,885

Int. Cl.³ G03C *7/26*

U.S. Cl. 430—552 **13 Claims**

1. A photographic element comprising a support, a photographic silver halide emulsion and a photographic coupler comprising a coupler moiety and a ballast moiety, the ballast moiety being terminated with a hydroxyphenylsulfonyl group or a hydroxyphenylsulfinyl group.

4,443,537

HYDROQUINONE DERIVATIVES AND THEIR USE IN PHOTOGRAPHIC MATERIALS

Stephen R. Postle; Patrick D. P. Thomas, and Brian R. D. Whitear, all of Brentwood, England, assignors to Ciba-Geigy AG, Basel, Switzerland

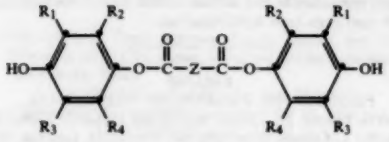
Division of Ser. No. 306,846, Sep. 29, 1981, Pat. No. 4,417,072. This application Sep. 24, 1982, Ser. No. 422,926

Claims priority, application United Kingdom, Oct. 2, 1980, 8031742

Int. Cl.³ G03C *1/06*

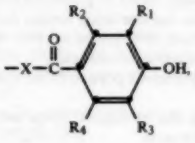
U.S. Cl. 430—566 **8 Claims**

1. A photographic silver halide material which comprises on a support at least one colloid silver halide layer and at least one colloid layer which comprises at least one substituted hydroquinone developing compound of the formula



(I)

wherein R_1 to R_4 are each hydrogen or alkyl having from 1 to 4 carbon atoms, Z is an aromatic ring selected from the group consisting of furylene, thienylene, pyrrolylene, pyridinylene or 1,2- or 1,4-phenylene or is a group —X—Y—X— wherein X has the meaning assigned to Z and Y is $—SO_2—$, —SO—, —CO— or =PO—A, wherein A is alkyl or alkoxy having from 1 to 4 carbon atoms, phenyl, phenoxy or a group of the formula



wherein R_1 to R_4 and X are as defined.

4,443,538

STABILIZATION OF IMMOBILIZED ENZYMES WITH GLYCEROL

Peter S. J. Cheetham, Reading, England, assignor to Tate & Lyle Public Limited Company, London, England

Filed May 5, 1982, Ser. No. 375,179

Claims priority, application United Kingdom, May 11, 1981, 8114295

Int. Cl.³ C12P *1/04, 19/18;* C12N *11/10, 1/04*

U.S. Cl. 435—41 **14 Claims**

9. A method for extending the storage stability of alginate gel-immobilized cells containing an enzyme system, wherein said gel-immobilized cells are contacted with glycerol in a ratio of from 2:1 to 1:5, expressed as kilograms of cells per liter of glycerol.

4,443,539

PROCESS FOR PREPARING BOVINE GROWTH HORMONE

Thomas H. Fraser, Kalamazoo, and Barbara J. Bruce, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 119,037, Feb. 5, 1980, abandoned. This application Jun. 8, 1981, Ser. No. 271,449

Int. Cl.³ C12N *15/00, 1/18, 1/20;* C12P *21/00;* C12R *1/19, 1/865*

U.S. Cl. 435—68 **4 Claims**

1. A process for preparing bovine growth hormone which comprises culturing *S. cerevisiae LL*20 (pBGH1), having the deposit accession number NRRL Y-12485, in an aqueous nutrient medium under controlled conditions.

4,443,540

PROTEIN HYDROLYSIS

Munir Chervan, and William D. Deeslie, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Continuation of Ser. No. 154,388, May 9, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 420,196

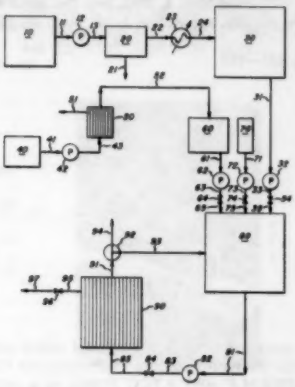
Int. Cl.³ C12P *21/06;* A23L *1/20;* A23J *1/20, 1/14*

U.S. Cl. 435—69 **25 Claims**

1. A process for the hydrolysis of protein comprising the steps of:

(a) hydrolyzing a selected protein material, dispersed in an aqueous medium together with at least one active proteolytic enzyme component, at a controlled temperature and alkaline pH;

(b) separating the hydrolyzed protein material, by filtration employing a molecular weight-selective filter medium, into a lower molecular weight first protein filtrate fraction



and a higher molecular weight second protein reject fraction, said second protein reject fraction including substantially all of the active proteolytic enzyme component;

(c) recycling at least a portion of the second protein reject fraction to the hydrolysis step; and

(d) recovering low molecular weight protein hydrolyzate from the first protein fraction.

4,443,541

PROCESS FOR PREPARING AN INDENEDIONE AND A MYCOBACTERIUM CULTURE THEREFOR

John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 375,914, May 7, 1982, abandoned. This application Jun. 4, 1982, Ser. No. 384,831

Int. Cl.³ C12P *7/38, 33/16;* C12N *1/20;* C12R *1/33*

U.S. Cl. 435—149 **5 Claims**

1. A process for preparing (2+)-(7aS)-2,3,7,7a-tetrahydro-7a-methyl-(1H)-indene-1,5(6H)-dione which comprises cultivating *Mycobacterium fortuitum* NRRL B-15026 in a fermentation beer, in an aqueous, nutrient medium under aerobic conditions in the presence of a steroid with or without 17-hydrocarbon side chains to produce (2+)-(7aS)-2,3,7,7a-tetrahydro-7a-methyl-(1H)-indene-1,5(6H)-dione in the fermentation beer and isolating (2+)-(7aS)-2,3,7,7a-tetrahydro-7a-methyl-(1H)-indene-1,5(6H)-dione from the fermentation beer.

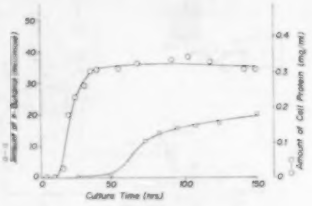
5. A biologically pure culture of mutant of *Mycobacterium fortuitum,* having the deposit accession number NRRL B-15026, which is characterized by its ability to selectively degrade steroids with or without 17-hydrocarbon side chains, in the presence of an aqueous nutrient medium and aerobic conditions, and to accumulate (2+)-(7aS)-2,3,7,7a-tetrahydro-7a-methyl-(1H)-indene-1,5(6H)-dione in the fermentation beer.

4,443,542

PROCESS FOR THE PRODUCTION OF BUTANOL AND NOVEL MICROORGANISM COMPOSITION USED THEREIN

Shinsaku Hayashida; Seiya Ogata, and Sadazo Yoshino, all of Fukuoka, Japan, assignors to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Mar. 4, 1982, Ser. No. 354,730
Claims priority, application Japan, Aug. 20, 1981, 56-129452
Int. Cl.³ C12P 7/16
U.S. Cl. 435—160 9 Claims



1. A process for producing butanol which comprises cultivating the butanol-producing microorganism Clostridium sp. AH-1 (FERM-P 6093 ATCC 39045), in a nutrient medium containing a cellulose material as the carbon source to assimilate said cellulose directly to produce butanol in a culture medium and recovering the butanol from the culture medium.

8. A biologically pure culture of Clostridium sp. AH-1 (FERM-P 6093, ATCC39045), said culture being capable of producing butanol from cellulosic materials.

4,443,543

SEMIBATCH ETHANOL PRODUCTION

Peter L. Rogers, Northwood, and David E. Tribe, Maroubra, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Dec. 2, 1981, Ser. No. 327,161
Claims priority, application Australia, Dec. 8, 1980, PE6812
Int. Cl.³ C12P 7/06
U.S. Cl. 435—161 6 Claims

1. A process for the production of ethanol from a medium containing glucose or another carbohydrate fermentable by *Zymomonas mobilis*, comprising fermenting in the medium in a continuous, semibatch or batch manner flocculent *Zymomonas mobilis*, ATCC 31822 which forms aggregates of 100 cells or more under the fermenting conditions, periodically allowing the flocculent cells to settle, removing the ethanol containing supernatant and introducing fresh fermentation medium into the fermenter.

4,443,544

ETHANOL PRODUCTION IN A CONTINUOUS PROCESS WITH CELL RECYCLE

Peter L. Rogers, Northwood, and David E. Tribe, Maroubra, both of Australia, assignors to Unisearch Limited, Kensington, Australia

Filed Mar. 3, 1981, Ser. No. 240,140
Claims priority, application Australia, Mar. 5, 1980, PE2655; May 15, 1980, PE3561
Int. Cl.³ C12P 7/14
U.S. Cl. 435—162 7 Claims

1. A process for the production of ethanol from a culture medium containing a fermentable carbohydrate, said process consisting essentially of continuously anaerobically culturing *Zymomonas mobilis* in the culture medium, continuously or periodically drawing off a portion of the culture medium to give a withdrawn portion and replacing that portion with fresh culture medium, separating from the withdrawn portion of the culture medium cells of *Zymomonas mobilis* contained therein, returning said cells to the culture medium, and recovering the ethanol contained in the portion of the culture medium from which said cells have been removed.

4,443,545

PROCESS FOR PRODUCING HEPARINASE

Robert S. Langer, Jr., Cambridge; Robert Linhardt, Somerville; Charles L. Cooney, Brookline, and Parrish M. Galliher, West Newton, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 180,780, Aug. 25, 1980, Pat. No. 4,341,869. This application Jan. 8, 1982, Ser. No. 337,910
Int. Cl.³ C12N 9/88
U.S. Cl. 435—232 5 Claims

1. A process for producing heparinase comprising:

(a) growing *Flavobacterium heparinum* in a medium, which medium comprises a carbon source having a concentration of between about 15 grams per liter and about 1 gram per liter, the medium being further defined as comprising less than about 10^{-2} grams per liter of sulfur, other than sulfur contained in amino acids;

(b) harvesting at least a portion of the *Flavobacterium heparinum;* and

(c) separating the heparinase from other proteins in the harvested bacteria.

4,443,546

PROCESS AND COMPOSITION FOR PROPAGATING MAMMALIAN CELLS

Michael B. Stemerman, Waban; Robert Weinstein, Brighton, and Thomas Maciag, Wayland, all of Mass., assignors to The Beth Israel Hospital Association, Boston, Mass.

Continuation of Ser. No. 166,179, Jul. 7, 1980, abandoned. This application Feb. 1, 1982, Ser. No. 344,508
Int. Cl.³ C12N 5/00, 5/02
U.S. Cl. 435—240 2 Claims

1. A serum-free cell growth medium comprising:
EGF: 1.0 ng/ml–10 μg/ml,
Cohn fraction IV (modified): 1.0 μg/ml–100 μg/ml,
Thrombin: 100 ng/ml–10 μg/ml,
Insulin: 10 ng/ml–10 μg/ml,
Transferrin: 10 ng/ml–10 μg/ml,
ECGF: 500 ng/ml–150 μg/ml,
Hydrocortisone: 5×10^{-7} M–5×10^{-4} M,
Nutrient source: Medium 199 (balance).

4,443,547

ANIMAL VACCINE AGAINST COLIBACILLOSIS, PREPARATION AND USE

Philippe Gouet, Beaumont; Michel G. Contrepois; Henri-Charles Dubourguier, both of Clermont-Ferrand; Jean-Pierre Girardeau, Romagnat; Hubert L. J. Goby; Therese M. Goby, both of Nevers; Anne M. Goby, Varennes Vauzelles, and Genevieve Goby, La Chapelle St Ursin, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Division of Ser. No. 193,449, Oct. 3, 1980, Pat. No. 4,343,792. This application May 6, 1982, Ser. No. 375,541
Claims priority, application France, Oct. 3, 1979, 79 24665
Int. Cl.³ C12N 1/20, 15/00; A61K 39/108
U.S. Cl. 435—253 3 Claims

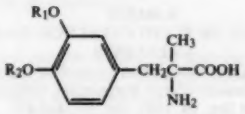
1. A biologically pure culture of a strain of *E. coli* having the F(31A) surface antigen recognizable by seroagglutination with a specific antiserum of said antigen, prepared from the standard strain (collection n°I-105 at the Institute Pasteur), said antiserum not recognizing the K99 antigen (reference strain B41), or the Y antigen (collection n°I-104), or the 47A antigen (collection n°I-106), said culture when inactivated yielding a vaccine effective in treating diarrhea in newborn animals.

4,443,548
PROCESS FOR PREPARING L-α-METHYLPHENYL ALANINES

Tokio Oshima; Tomio Kimura; Tetsuo Omata, and Noritada Iwamoto, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed May 7, 1982, Ser. No. 376,236
Claims priority, application Japan, May 14, 1981, 56-71397
Int. Cl.³ C07B *19/02;* C12P *13/22*
U.S. Cl. 435—280 5 Claims

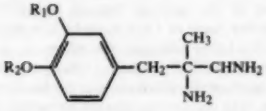
1. A process for preparing an L-α-methylphenyl alanine having the general formula: [I]



[I]

wherein R_1 and R_2 may be independently a hydrogen atom or lower alkyl groups, or R_1 and R_2 may be alkylene groups combined together to form 5 through 8-membered rings comprising the steps of:

(a) interacting a DL-α-methylphenyl alanine amide having the general formula: [II]



[II]

wherein R_1 and R_2 are the same as defined above, with (i) a cultivation mixture of a microorganism capable of producing an enzyme catalyzing the hydrolysis of L-isomer of DL-α-methylphenyl alanine amides (ii) a culture broth or cells separated from the cultivation mixture, (iii) the enzyme isolated from the culture broth or cells, or (iv) immobilized preparation of the cultivation mixture, whereby assymmetric hydrolysis of an L-α-methylphenyl alanine amide is effected; and

(b) separating the resultant L-α-methylphenyl alanines from the hydrolysis mixture.

4,443,549
PRODUCTION OF MONOCLONAL ANTIBODIES AGAINST BACTERIAL ADHESINS

Peter L. Sadowski, Eden Prairie, Minn., assignor to Molecular Genetics, Inc., Minnetonka, Minn.

Continuation-in-part of Ser. No. 312,993, Oct. 19, 1981. This application Oct. 7, 1982, Ser. No. 428,622
Int. Cl.³ A61K *39/40;* C12N *15/00*
U.S. Cl. 436—548 43 Claims

15. A process for producing monoclonal antibodies against an adhesin of a pathogenic bacterium, which adhesin mediates attachment of said bacterium to mucocutaneous tissue, comprising: (a) propagating a hybridoma (i) formed by fusing a P3/NSI/1-Ag4-1 myeloma cell with a murine cell capable of producing antibodies against an adhesin of a pathogenic bacterium, which adhesin mediates attachment of said bacterium to mucocutaneous tissue, said murine cell having been obtained from a BALB/c mouse immunized with a bacterial adhesion and (ii) isolated after in vitro culturing in selective HAT medium; and (b) harvesting the antibodies produced by said hybridoma.

22. Hybridoma cell line 2BD4E4, ATCC Number HB8178, formed by fusing a P3/NSI/1-Ag 4-1 murine myeloma cell with a murine spleen cell obtained from a BALB/c mouse immunized with K-99 pili, which hybridoma cell line produces monoclonal antibodies against a K-99 pilus.

4,443,550
GLASS COMPOSITION SUITABLE FOR PRODUCTION OF FIBROUS WOLLASTONITE, METHOD FOR PRODUCING SAID WOLLASTONITE, AND WOLLASTONITE OBTAINED THEREBY

Makoto Kume, and Toshiaki Mizuno, both of Hyogo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Sep. 1, 1981, Ser. No. 298,395
Claims priority, application Japan, Sep. 1, 1980, 55/120830
Int. Cl.³ C03C *3/08, 3/22, 15/00*
U.S. Cl. 501—65 14 Claims

1. A glass composition suitable for production of a fibrous wollastonite consisting essentially of, in % by weight:

SiO_2	35 to 60
CaO	30 to 55
B_2O_3	1 to 30
Li_2O	0 to 4
Al_2O_3	0 to 8
and $Na_2O + K_2O$	0 to 8,

wherein at least one of Li_2O, Al_2O_3, and Na_2O is present.

3. A method for producing a fibrous wollastonite which comprises uniformly and simultaneously heat treating all portions of a glass consisting essentially of, in % by weight:

SiO_2	35 to 60
CaO	30 to 55
B_2O_3	1 to 30
Li_2O	0 to 4
Al_2O_3	0 to 8
and $Na_2O + K_2O$	0 to 8

to form a crystallized glass containing therein bundles of needle wollastonite crystals, and thereafter treating the crystallized glass to disintegrate the bundles of the wollastonite crystals by one or more treatment methods including pulverization, rapid cooling of crystallized glass heated to high temperatures, and immersion of the crystallized glass in an aqueous alkaline eluting solution to selectively elute only the glass phase present in the crystallized glass.

4,443,551
METHOD AND NEW DISTRIBUTOR FOR DELIVERING HIGH VELOCITY GAS FROM A GAS DISTRIBUTOR THROUGH A NOZZLE WITH DECREASED EROSION IN THE NOZZLE

Thomas A. Lionetti, Houston, and John P. MacLean, Stafford, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,763
Int. Cl.³ B01J *29/38;* C10G *11/18;* F27B *15/10;* F23L *5/00*
U.S. Cl. 502—41 9 Claims

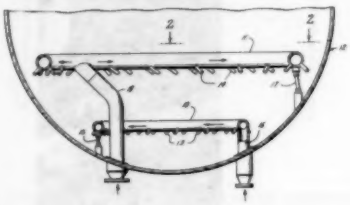
1. A method for delivering a high velocity oxygen-carrying

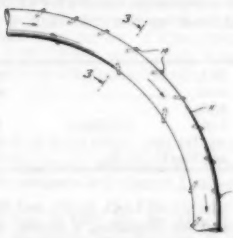
gas from a gas distributor to a zone of spent catalyst in a regenerator in a fluid catalytic cracking process comprising,

(a) flowing the high velocity oxygen-carrying gas through a gas distributor downward to nozzles therein, and

(b) deflecting the oxygen-carrying gas from the distributor to the nozzles downward and through an angle in the range of 30° to 75° to the flow of gas in the gas distributor for decreased erosion in the nozzles by catalyst drawn up from the regenerator and for reduced required power consumption.

2. A method for delivering high velocity air from an air distributor to a nozzle therein in a regenerator in a fluid catalytic cracking process comprising,





(a) diverting the air from the air distributor to the nozzle downward and through an angle in the range of 30° to 75° to the flow of air in the air distributor for decreased erosion in the nozzle by catalyst drawn up from the regenerator and for reduced required power consumption.

7. A method for delivering high velocity air from an air distributor to a nozzle therein in a regenerator in a fluid catalytic cracking process comprising,

(a) diverting the air from the air distributor to the nozzle through an angle in the range of 30° to 75° to the flow of air in the distributor and 30° to 75° downward from the horizontal.

4,443,552

CATALYSTS FOR THE CATALYTIC CRACKING OF HEAVY OIL

Hiroshi Iida; Akira Iino, both of Sodegaura, and Kosaku Honna, Ichihara, all of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,441

Claims priority, application Japan, Aug. 24, 1981, 56-131622; Sep. 14, 1981, 56-145015

Int. Cl.³ B01J *29/14*

U.S. Cl. 502—66 **12 Claims**

1. An improved catalyst for the catalytic cracking of heavy oil comprising a crystalline aluminosilicate zeolite prepared by treating a starting aluminosilicate zeolite having a SiO_2/Al_2O_3 molar ratio of at least 4.6 and a Na_2O content of not more than 2.4% by weight with an acidic aqueous solution containing iron ions having a pH of 2 or less, whereby a part of the original aluminum content of said starting aluminosilicate zeolite is replaced by iron.

7. An improved catalyst for the catalytic cracking of heavy oil comprising a crystalline aluminosilicate zeolite prepared by treating a starting aluminosilicate zeolite having a SiO_2/Al_2O_3 molar ratio of at least 4.6 and a Na_2O content of not more than 2.4% by weight with steam and then treating said steam-treated zeolite with an acidic aqueous solution containing iron ions having a pH of 2 or less, whereby a part of the original aluminum content of said starting aluminosilicate zeolite is replaced by iron.

4,443,553

PRODUCTION OF FLUID CATALYTIC CRACKING CATALYSTS

Robert L. Chiang, and Julius Scherzer, both of Anaheim, Calif., assignors to Harshaw/Filtrol Partnership, Oakland, Calif.

Filed Sep. 20, 1982, Ser. No. 420,439

Int. Cl.³ B01J *29/06*

U.S. Cl. 502—68 **7 Claims**

1. In the process of producing fluid catalytic cracking catalysts by spray drying, an aqueous slurry containing a mixture of a Y-type zeolite, an alumina-containing binder, and a silica source selected from naturally occurring and synthetic silica-containing materials and mixtures thereof, the improvement which comprises incorporating in the slurry a slurry viscosity-reducing additive of the general formula $[Al_2(OH)_{6-y}Cl_y]_x$, where x is within the range of 1 and 6, and y is in the range of 1 to 2, the additive being added to the slurry in an amount equivalent to from about 0.5% to about 2.5% by weight, calculated as Al_2O_3, based on the solids content of the slurry, spray drying the slurry, and recovering essentially water-free catalyst particles.

3. The process of claim 1, wherein the synthetic silica source is ammonium polysilicate.

4,443,554

ACTIVATION OF ALKALI METAL ZEOLITE CATALYSTS BY STEAMING

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 382,863

Int. Cl.³ B01J *29/28, 29/06*

U.S. Cl. 502—71 **7 Claims**

1. A method for increasing acid cracking activity of alkali metal zeolites having a silica to alumina greater than about 12, a constraint index of about 1 to 12, and an initial α-value less than about 2 which comprises forming a mixture of the alkali metal zeolite with alumina and steaming the mixture at a temperature of at least about 300° C. for at least two hours to increase α-value.

4,443,555

METHOD FOR THE PREPARATION OF HIGH ACTIVITY PHOSPHOMOLYBDIC ACID BASED CATALYSTS

James L. Callahan, Wooster; Wilfrid G. Shaw, and Arthur F. Miller, both of Lyndhurst, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 271,487, Jun. 8, 1981, abandoned. This application Nov. 8, 1982, Ser. No. 439,704

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—211 **21 Claims**

1. A method for the preparation of second stage phosphomolybdic acid based catalysts comprising the steps of:

forming a solution of hydrated phosphomolybdic acid in a substantially anhydrous alkyl alcohol;

heating said solution to form a concentrate; and

drying and calcining said concentrate so as to form the catalyst.

4,443,556
CATALYST COMPOSITION

Kunitoshi Aoki, Kawasaki; Makoto Honda, Tokyo; Tetsuro Dozono, Yokosuka, and Tsutomu Katsumata, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 429,054

Claims priority, application Japan, Oct. 20, 1981, 56-166423

Int. Cl.³ B01J *27/14;* **C07C** *51/16, 120/02*

U.S. Cl. 502—212 **5 Claims**

1. A catalyst composition having a composition represented by the formula:

$$A_aB_bMo_{12}Bi_cFe_dNa_eP_fO_g$$

wherein

A is at least one element selected from the group consisting of cerium, lanthanum, neodymium, praseodymium, samarium, europium and gadolinium,

B is at least one element selected from the group consisting of potassium, rubidium and cesium,

a, b, c, d, e, f and g are the atomic ratios of A, B, molybdenum, bismuth, iron, sodium, phosphorus and oxygen, respectively, relative to twelve atoms of molybdenum, wherein:

a is between 0.1 and 4,

b is between 0.02 and 1,

c is between 0.5 and 10,

d is between 0.5 and 10,

e is between 0 and 3,

f is between 0 and 2, and

g is the number of oxygen atoms required to satisfy the valence requirements of the other elements present,

and supported on silica.

4,443,557
TREATMENT OF CATALYTIC RANEY NICKEL

Alfonso L. Baldi, Wynnewood, Pa., assignor to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 25,456, Mar. 30, 1979, Pat. No. 4,349,612, and a continuation-in-part of Ser. No. 172,671, Jul. 28, 1980, and a continuation-in-part of Ser. No. 281,405, Jul. 8, 1981, and a continuation-in-part of Ser. No. 302,979, Sep. 17, 1981, said Ser. No. 25,456, is a continuation-in-part of Ser. No. 963,313, Nov. 27, 1978, abandoned. This application Mar. 18, 1982, Ser. No. 359,212

Int. Cl.³ B01J *25/02*

U.S. Cl. 502—301 **9 Claims**

1. In the treatment of pyrophorically activated catalytic Raney type nickel with hydrogen peroxide to eliminate its pyrophoricity and still leave it catalytically active, the improvement according to which the nickel is separately contacted with essentially water at a temperature at least as high as 160° F. to cause the extraction of residual activating metal and the elimination of the tendency of the nickel to recover its pyrophoricity.

4,443,558
HIGHLY STABLE HYDROPROCESSING CATALYST

Kirk R. Gibson, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 8, 1982, Ser. No. 366,740

Int. Cl.³ B01J *23/84*

U.S. Cl. 502—314 **12 Claims**

1. The method of making a catalyst for hydroprocessing hydrocarbonaceous feedstocks comprising:

peptizing an alumina powder with an acid aqueous solution of a Group VIII metal salt;

neutralizing said peptized alumina with an aqueous solution of a nitrogen containing base having a soluble Group VI metal salt dissolved therein;

extruding particles of said neutralized alumina;

drying said extruded particles; and

calcining the dried particles.

4,443,559
CATALYTIC DISTILLATION STRUCTURE

Lawrence A. Smith, Jr., Bellaire, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

Filed Sep. 30, 1981, Ser. No. 307,120

The portion of the term of this patent subsequent to Nov. 24, 1998, has been disclaimed.

Int. Cl.³ B01J *35/04*

U.S. Cl. 502—527 **12 Claims**

1. A catalytic distillation structure comprising a catalyst component intimately associated with or surrounded by a resilient component, which is comprised of at least 70 volume % open space for providing a matrix of substantially open space.

4,443,560
ADIABATICALLY REFORMING A REFORMED GAS FOR PRODUCING METHANOL

Joseph R. Le Blanc, Jr.; Dewey O. Moore, both of Houston, and Robert V. Schneider, III, Missouri City, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Jul. 28, 1982, Ser. No. 402,468

Int. Cl.³ C07C *27/06, 31/04*

U.S. Cl. 518—703 **1 Claim**

1. In a process for producing methanol and purge gas in a first methanol plant and a second methanol plant wherein methanol from the first methanol plant is synthesized from a reformed gas mixture comprising hydrogen, methane, and carbon oxides produced by steam reforming C_1 to C_4 hydrocarbons and wherein methanol from the second methanol plant is synthesized from a clean synthesis gas comprising hydrogen and carbon monoxide produced by partial oxidation with substantially pure oxygen of a heavy carbonaceous material, the improvement which comprises:

(a) recovering purge gas containing hydrogen, methane, and carbon monoxide from the first methanol plant;

(b) adiabatically reforming the recovered purge gas to produce adiabatically reformed purge gas; and

(c) mixing adiabatically reformed purge gas with clean synthesis gas from the heavy carbonaceous material partial oxidation step and introducing the resulting mixed gas to the second methanol plant.

4,443,561
PROCESS FOR THE PREPARATION OF ORGANIC COMPOUNDS

Sikko J. A. Boelema, The Hague; Martin F. M. Post, and Swan T. Sie, both of Amsterdam, all of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 24, 1982, Ser. No. 381,619

Claims priority, application Netherlands, Jul. 17, 1981, 8103397

Int. Cl.³ C07C *1/04, 27/06*

U.S. Cl. 518—704 **7 Claims**

1. A two-step process for the preparation of organic compounds from a mixture of hydrogen and carbon monoxide, wherein a H_2/CO mixture having a H_2/CO molar ratio below 2.0 is divided into two portions, a larger portion A and a smaller portion B, of the same composition; in the first step portion A, through contact with a catalyst comprising one or more metal components having catalytic activity for the conversion of a H_2/CO mixture into hydrocarbons and/or oxygen-containing organic compounds, is converted into a reaction mixture in which the H_2/CO molar ratio (R_1) is lower than 2.25; and portion B, through contact, together with water, at a temperature above 325° C., with a catalyst having CO-shift activity, is converted into a reaction mixture in which the H_2/CO molar ratio is higher than R_1 and also higher than 1.75; hydrogen and carbon monoxide present in the reaction prod-

uct from portion A, optionally together with other components from this reaction product, are mixed with the reaction product from portion B to form a mixture having a H_2/CO molar ratio of from 1.75–2.25; and in the second step the mixture thus obtained is contacted with a catalyst comprising one or more metal components having activity for the conversion of a H_2/CO mixture into paraffinic hydrocarbons, which metal components have been chosen from the group formed by cobalt, nickel and ruthenium.

4,443,562

METHOD AND APPARATUS FOR PRODUCING LIGHTWEIGHT CELLULAR MATERIALS AND STRUCTURAL ARTICLES

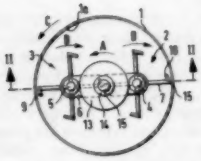
Karl M. Mayer, Immenhofen 55, 8951 Ruderatshofen, Fed. Rep. of Germany

Filed Jul. 19, 1982, Ser. No. 399,692

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128283

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—83 **13 Claims**



1. In a process for making a ceramic material for the production of lightweight structural members and coatings having high heat and noise insulating values, the steps comprising:

A. introducing into a mixing chamber (i) hydrated lime in an effective amount up to 80 volume percent; (ii) an additive in an effective amount up to 15 volume percent, said additive being selected from the group consisting of interpolymers of vinyl acetate, vinyl chloride and vinyl laurate; copolymers of vinyl acetate and vinyl chloride; interpolymers of vinyl acetate, vinyl chloride and ethylene; and mixtures thereof; (iii) rock wool in an effective amount up to 50 volume percent; and (iv) up to 50 volume percent aggregate;

B. introducing into the initial mixture in the chamber water in an effective amount up to 50 volume percent; and

C. mixing at high speed the water/solids mixture to produce within 30–90 seconds a foamed mixture having air bubbles comprising 60–80 volume percent thereof.

4,443,563

POLYURETHANES BASED ON 1;4-3:6 DIANHYDROHEXITOLS

Stoil K. Dirlikov, and Connie J. Schneider, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 8, 1983, Ser. No. 502,400

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—174 **11 Claims**

1. A polyurethane comprising the reaction product of a polyisocyanate and a dianhydrohexitol.

4,443,564

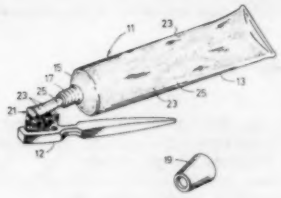
PACKAGED SPECKLED DENTIFRICE

John P. Hauschild, Bridgewater, and Joseph R. Principe, East Brunswick, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 307,272, Sep. 30, 1981, Pat. No. 4,376,762. This application Aug. 30, 1982, Ser. No. 413,195

Int. Cl.³ A61K *7/16*

U.S. Cl. 523—105 **18 Claims**



1. A packaged dentifrice comprising a dispensing container containing a dentifrice comprising water, humectant, gelling agent, detergent and flavor, all of which are constituents of a gelled vehicle of the dentifrice, and a dental polishing agent, uniformly distributed throughout the vehicle, and visible functional speckles distributed through the dentifrice, which are agglomerates of water insoluble powdered functional material and a combination of a water insoluble, ethanol soluble ethyl cellulose binder and a water soluble binder.

4,443,565

THERMOPLASTIC RESIN COMPOSITION CONTAINING METAL FOIL FRAGMENTS AND PROCESS FOR ITS PRODUCTION

Kanji Kasahara, and Akira Sakamoto, both of Yokkaichi, Japan, assignors to Mitsubishi Monsanto Chemical Company, Tokyo, Japan

Filed Feb. 1, 1983, Ser. No. 463,017

Claims priority, application Japan, Feb. 26, 1982, 57-30051; Aug. 20, 1982, 57-144332

Int. Cl.³ G21K *1/10*; G21F *1/10*

U.S. Cl. 523—137 **20 Claims**

1. A composition comprising (a) 100 parts by weight of metal foil fragments, (b) from 1 to 10 parts by weight of a first polymer covering the surfaces of the metal foil fragments and obtained by first homopolymerizing or copolymerizing with each other at least one of monomers selected from the group consisting of acrylic acid, methacrylic acid, and alkylacrylate, an aminoalkylacrylate, an alkylmethacrylate and an aminoalkylmethacrylate in the presence of the metal foil fragments, and (c) from 5 to 33 parts by weight of a second polymer obtained by subsequently polymerizing a mixture of an aromatic vinyl monomer and a monomer copolymerizable with the aromatic vinyl monomer selected from the group consisting of acrylonitrile, methacrylonitrile, acrylic acid esters and methacrylic acid esters.

13. A process for preparing a thermoplastic resin composition containing metal foil fragments, which comprises first suspension-homopolymerizing or copolymerizing with each other from 1 to 10 parts by weight of at least one of monomers selected from the group consisting of acrylic acid, methacrylic acid, an alkylacrylate, an alkylmethacrylate, an aminoalkylacrylate and an aminoalkylmethacrylate in the presence of 100 parts by weight of metal foil fragments and then adding and suspension-polymerizing from 5 to 33 parts by weight, based on 100 parts by weight of the metal foil fragments, of a mixture of an aromatic vinyl monomer and a monomer copolymerizable with the aromatic vinyl monomer selected from the group consisting of acrylonitrile, methacrylonitrile, acrylic acid esters and methacrylic acid esters.

4,443,566

SIZED REINFORCING FIBERS SUITABLE FOR USE IN COMPOSITES OF IMPROVED IMPACT RESISTANCE

Lincoln Ying, Bridgewater, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,248
Int. Cl.³ B32B 9/00, 27/00; D02G 3/00
U.S. Cl. 523—205 16 Claims

1. A reinforcing fiber having a coating on the surface thereof in a concentration of approximately 0.5 to 3.0 percent by weight based on the weight of the reinforcing fiber of a sizing composition which comprises as a first component an epoxy resin and a second component consisting of an organophosphazene elastomer.

8. A composite structure comprising a rigid polymeric matrix having reinforcing fibers incorporated therein which are coated on the surface thereof with approximately 0.5 to 3.0 percent by weight based on the weight of the reinforcing fibers of a sizing composition which comprises as a first component an epoxy resin and a second component consisting of an organophosphazene elastomer.

4,443,567

SINGLE-COMPONENT HARDENABLE SYNTHETIC RESIN COMPOSITION AND METHOD OF USING SAME

Danilo Sternisa, Emmendingen, and Herbert Kistner, Freiburg-Betzenhausen, both of Fed. Rep. of Germany, assignors to Upat GmbH & Co., Emmendingen, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,081
Claims priority, application Fed. Rep. of Germany, Oct. 6, 1981, 3139627
Int. Cl.³ C08L 89/00; E21D 20/02
U.S. Cl. 523—211 7 Claims

1. A reactive synthetic resin mortar composition comprising a mortar mass having a predetermined color and comprising:

a resin phase in which microcapsules of a hardener reactive with said resin phase are dispersed for rupture of said capsules upon agitation of said mass to disperse said hardener in said resin phase; and

microcapsules of a coloring agent dispersed in said mass and having opaque shells of said color, said shells being rupturable upon rupture of said microcapsules to release coloring agent into said mass upon the dispersal of said hardener therein.

4,443,568

POLYMERIZATION PROCESS AND PRODUCT

James T. K. Woo, Medina, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 314,520
Int. Cl.³ C08L 63/00
U.S. Cl. 523—406 10 Claims

1. In a process for polymerizing ethylenically unsaturated monomers in the presence of an aqueous dispersed resinous reaction product produced in a first stage addition polymerization of ethylenically unsaturated monomer in the presence of an epoxy resin and in the presence of at least 3% by weight benzoyl peroxide based on monomer, wherein the resinous reaction product comprises epoxy resin, addition polymer of polymerized monomers, and grafted polymer of addition polymer grafted to the epoxy resin wherein the resinous reaction product contains between 30% to 90% by weight of said epoxy resin and is dispersed in water, the improvement comprising:

polymerizing second stage ethylenically unsaturated monomers in the presence of said resinous reaction product on a weight basis of between 1 to 5 weight parts of second stage monomer per 20 weight parts of first stage resinous reaction product, wherein said second stage monomers are polymerized in the presence of peroxide catalyst in combination with about 0.1% and 10% of a benzoin derivative reducing agent based on the weight of second stage monomer polymerized to produce a resulting product containing between about 1 to 5 weight parts of second stage polymerized monomer per about 20 weight parts of first stage resinous reaction product.

4,443,569

PROCESS FOR THE PRODUCTION OF THERMOSETTING AQUEOUS ELECTROCOATING COMPOSITIONS SUSCEPTIBLE OF BEING CATHODICALLY DEPOSITED AND THE USE THEREOF

Manfred Schröder, Herdecke, and Arty R. T. Subramanyam, Wuppertal, both of Fed. Rep. of Germany, assignors to Lackwerke Wülfing GmbH & Co., Wuppertal, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 250,639, Apr. 3, 1981, Pat. No. 4,376,848. This application Apr. 8, 1982, Ser. No. 366,522
Claims priority, application European Pat. Off., Dec. 22, 1981, 81110669.9
The portion of the term of this patent subsequent to Mar. 15, 2000, has been disclaimed.
Int. Cl.³ C08G 71/04; C08L 74/04; C09D 5/40
U.S. Cl. 523—414 15 Claims

1. A process for the production of a thermosetting cathodically depositable aqueous composition for electrocoating comprising

(A) reacting under an inert gas a nitrogen base-containing binder having tertiary amino groups and primary, secondary or mixed primary and secondary OH groups with one or more sparingly water soluble to water insoluble cobalt, copper, lead, nickel, or manganese compounds at an elevated temperature to form a reaction product;

(B) protonating the reaction product with an acid; and

(C) diluting the product with water after said acid protonating step.

4,443,570

ASPHALT COMPOSITIONS

Homer L. Draper; Floyd H. Holland, and Robert L. Brost, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 16, 1982, Ser. No. 399,108
Int. Cl.³ C08K 5/01; C08L 91/08, 95/00
U.S. Cl. 524—62 11 Claims

1. An asphaltic composition having a softening point of at least about 140° F. and which is pliable at low temperatures (below freezing) consisting essentially of

(a) about 55–65 weight percent of an asphalt,

(b) about 17–21 weight percent of a hydrogenated rubber,

(c) about 16–20 weight percent of a petroleum solvent, and

(d) about 2–4 weight percent of essentially amorphous silica.

4,443,571

LASER PRINTABLE POLYARYLENE SULFIDE COMPOSITIONS

Donald G. Needham, and John E. Leland, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 30, 1982, Ser. No. 429,738
Int. Cl.³ C08L 81/00
U.S. Cl. 524—90 8 Claims

1. A composition comprising

(a) polyarylene sulfide and

(b) at least one print compound selected from the group consisting of

monoazo-nickel complex
lead chromate-lead molybdate
quinacridone
nickel-antimony-titanium
cobalt-zinc-silica
lead chromate.

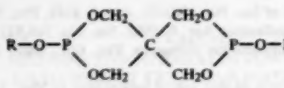
4,443,572
POLYOLEFIN STABILIZERS

Lyle D. Burns, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 22, 1982, Ser. No. 421,224
Int. Cl.³ C08K *5/36*
U.S. Cl. 524—120 **20 Claims**

1. A polymeric composition of at least one polymer of an olefin having 2 to 8 carbon atoms per molecule, having therein a stabilizer system, comprising:

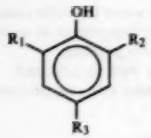
(a) from 0.1 to 5.0 weight percent of at least one pentaerythritol phosphite compound of the formula:



wherein R and R' are the same or different selected from the group consisting of alkyl, cycloalkyl, aryl, alkoxyalkyl, the halo-substituted derivatives thereof containing from one to 20 carbon atoms;

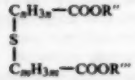
(b) from 0.1 to 10.0 weight percent of at least one Group IIA alkaline earth metal oxide;

(c) a hindered phenol of the formula



wherein R_1 and R_3 are alkyl, cycloalkyl, aryl, or arylalkyl groups having up to 10 carbon atoms per group such that said hindered phenol is present in an amount by weight relative to said phosphite compound in the range of from about 0.01:10 to about 0.5:1.0; and

(d) at least one thioester represented by the general formula



wherein R'' and R''' are alkyl groups containing 6 to 24 carbon atoms and n and m are integers from 1 to 6 such that said thioester is present in an amount by weight relative to said phosphite compound in the range of from about 0.01:10 to about 0.5:10.

4,443,573
ADDITIVE DISPERSIONS AND PROCESS FOR THEIR INCORPORATION WITH FIBER-FORMING POLYMERS

Rodney L. Wells, Chester, and Monty L. Rowe, Midlothian, both of Va., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 254,349, Apr. 15, 1981, abandoned. This application May 6, 1982, Ser. No. 375,520
Int. Cl.³ C08K *5/10*
U.S. Cl. 524—308 **15 Claims**

1. In a process for melt-spinning yarn from a synthetic fiber-forming polymer, the improvement comprising:

adding to the polymer prior to spinning of filaments of said polymer, a dispersion comprising:

20 to 80 weight percent of at least one polymer additive having an average diameter of up to 0.5 micron at spinning temperature; and 20 to 80 weight percent of a C_5–C_{26} fatty acid ester of pentaerythritol.

4,443,574
COATING COMPOSITION OF POLY(ARYLENE SULFIDE), POLYTETRAFLUOROETHYLENE AND BARIUM OR CALCIUM SULFATE

Jean-Louis G. Coq, Court-St-Etienne, and Herman E. Seymus, Lint, both of Belgium, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1982, Ser. No. 443,059
Int. Cl.³ C08K *3/30, 3/24*
U.S. Cl. 524—423 **11 Claims**

1. A coating composition comprising poly(arylene sulfide), polytetrafluoroethylene, at least one of barium and calcium sulfates and a liquid carrier, wherein

the weight ratio of poly(arylene sulfide) to polytetrafluoroethylene is from 50:50 to 85:15, and

the weight ratio of the sulfates to poly(arylene sulfide) plus polytetrafluoroethylene is from 10:100 to 60:100.

4,443,575
COMPOSITION FOR BACKING CARPETS

Sakuya Iwai, Tokyo, and Teruo Kajikawa, Yokosuka, both of Japan, assignors to Nippon Oil Co., Ltd., Nishishimbashi, Japan

Filed Oct. 26, 1982, Ser. No. 436,826
Claims priority, application Japan, Oct. 26, 1981, 56-171211
Int. Cl.³ C08K *5/01*
U.S. Cl. 524—486 **15 Claims**

1. A composition for backing a carpet, comprising:

(a) 5 to 65% by weight of an olefin-polar monomer copolymer having a polar monomer content of 5 to 40% by weight therein;

(b) 1 to 50% by weight of a synthetic oil comprising one or more non-condensed tricyclic aromatic hydrocarbon compounds having a boiling point of 250° C. or higher and a molecular weight of 258 to 482, and being liquid at room temperature;

(c) 30 to 90% by weight of an inorganic filler; and

(d) 0 to 5% by weight of a solid low-molecular compound component, said composition having been mixed at 100°–200° C.

4,443,576
TERPOLYMER COMPOSITION

Bhupati R. Bhattacharyya, Downers Grove; Manual Slovinsky, Woodridge; Raymond J. Wachala, Chicago; Lawrence E. Beske, Palos Hills, and Michael L. McCullar, Warrenville, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 29, 1982, Ser. No. 362,686
Int. Cl.³ C08L *33/00*
U.S. Cl. 524—522 **15 Claims**

1. A water soluble or swellable composition comprising the product formed by polymerizing together under free radical forming conditions:

(a) 10–70 weight percent of a water soluble monomer selected from the group consisting of acrylamide and methacrylamide;

(b) 15–70 weight percent of a monomer selected from the group consisting of acrylic acid, methacrylic acid and water-soluble salts of acrylic acid and methacrylic acid;

(c) 5–50 weight percent of a lower hydroxy alkyl acrylate;

(d) 0.5–10% of a water soluble polyfunctional monomeric branching agent having at least two $CH_2{=}C$ groups; and

(e) 0.1–15% of a water soluble copolymer having a molecular weight of from 2,000 to 50,000 of:

(1) a water-soluble monomer selected from the group consisting of acrylamide, acrylic acid, methacrylamide, methacrylic acid and water-soluble salts of acrylic and methacrylic acids; with,

(2) a C_1–C_8 alkyl acrylate, the ratio of water-soluble monomer to alkyl acrylate being 50:50 to 95:5.

4,443,577

ONE-COMPONENT MOISTURE CURABLE URETHANE COATING SYSTEM

William A. Higgins, Gates Mills, and John S. Perz, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Filed May 12, 1982, Ser. No. 376,822
Int. Cl.³ C08K 3/10
U.S. Cl. 524—590 24 Claims

1. A one-component, moisture-curable coating composition comprising

(A) a non-Newtonian colloidal disperse system comprising

(1) solid metal-containing colloidal particles predispersed in (2) a disperse medium of at least one inert organic liquid and (3) as an essential third component at least one member selected from the class consisting of organic compounds which are substantially soluble in said disperse medium, the molecules of said organic compound being characterized by polar substituents and hydrophobic portions; and

(B) an isocyanate-terminated prepolymer;

the neutralization base number of component (A) being adjusted to a level of about 3.0 or less by the addition of an acidic material to component (A) prior to combining components (A) and (B) to form said composition.

4,443,578

COLD APPLIED JOINT SEALANT

Richard A. Frier, Arlington Heights, Ill., assignor to W. R. Meadows, Inc., Elgin, Ill.

Filed Feb. 8, 1983, Ser. No. 464,852
Int. Cl.³ C08L 95/00
U.S. Cl. 524—705 3 Claims

1. A cold applied joint sealant having a pre-mixed formulation comprising:

asphalt;

plasticizing oil;

inorganic filler;

anti-settling agent;

a hydroxyl terminated liquid polybutadiene resin;

aromatic solvent;

a urethane catalyst; and,

a urethane reactant comprising a polymeric isocyanate;

wherein upon mixing the foregoing said hydroxyl terminated liquid polybutadiene resin reacts with said urethane reactant to form a polyurethane present in an amount by weight of from about 8% to 11% and having elastomeric properties, and wherein said sealant is capable of reaching an initial set in less than about 120 minutes and provides 300% extension at minus 20° F. and a penetration value of 125 to 145 @ 77° F. and 35–55 @ 0° F.

4,443,579

SILICONE RESIN COATING COMPOSITION ADAPTED FOR PRIMERLESS ADHESION TO PLASTIC AND PROCESS FOR MAKING SAME

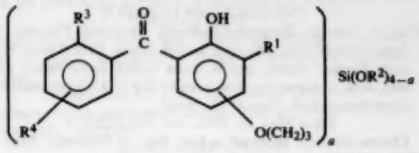
James E. Doin, Hoosick Falls, and Susan E. Hayes, Schenectady, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Dec. 8, 1981, Ser. No. 328,500
Int. Cl.³ C08L 83/00
U.S. Cl. 524—837 28 Claims

1. A coating composition adapted for adhesion to a plastic substrate without a primer, said composition being prepared by:

(A) prehydrolyzing

(i) a silylated ultraviclet light screening compound having the formula



wherein R^1 is hydrogen, C_1–C_8 alkyl or halogen; R^3 and R^4 are hydrogen, C_1–C_8 alkoxy, carboxy, halogen, hydroxy, amino, carbethoxy or $—Q—(CH_2)_3Si(OR^2)_3$; Q is —NH— or —O—; R^2 is C_1–C_8 alkyl; and a is an integer equal to 1–3 inclusive, in the presence of

(ii) an agent to catalyze conversion of the silane function of said silylated ultraviolet light screening compounds to a silanol; and thereafter

(B) adding a minor proportion of the hydrolysis product of step (A) to a major proportion of an aqueous partially condensed silicone resin composition including colloidal silica.

4,443,580

DCPD MODIFIED POLYESTER PHYSICAL PROPERTY IMPROVEMENT

Robert E. Hefner, Jr., Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1982, Ser. No. 411,169
Int. Cl.³ C08L 67/06
U.S. Cl. 525—44 15 Claims

1. A resin formulation having improved properties comprised essentially of:

(a) a dicyclopentadiene modified unsaturated polyester, polyesteramide, or a mixture thereof,

(b) a monovinyl aromatic monomer or mixture of monovinyl aromatic monomers, and

(c) a polyvinyl aromatic monomer or mixture of polyvinyl aromatic monomers wherein components (b) and (c) are present in amounts of 20 to 60 percent by weight of component (a), and component (c) comprises 1 to 33 percent by weight of the total weight of (b) and (c).

4,443,581

IMPACT MODIFIED POLYARYLATE BLENDS

Lloyd M. Robeson, Whitehouse Station, and Markus Matzner, Edison, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 27, 1981, Ser. No. 296,870
Int. Cl.³ C08L 67/02, 83/06, 69/00
U.S. Cl. 525—92 19 Claims

1. A thermoplastic molding composition having improved notched izod impact values after molding, said composition comprising in admixture:

(a) a polyarylate derived from a dihydric phenol and an aromatic dicarboxylic acid; and

(b) a siloxane-polyarylene polyether block copolymer and/or a siloxane polycarbonate block copolymer.

4,443,582

MIXTURES OF CHLOROPRENE POLYMERS AND THE PRODUCTION THEREOF

Rüdiger Musch, Bergisch-Gladbach; Gottfried Pampus, Cologne; Peter Müller, Kerpen; Ulrich Eisele, Leverkusen; Wolfgang Konter, Neuss, and Wilhelm Göbel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

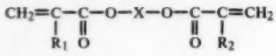
Filed May 19, 1982, Ser. No. 379,919

Claims priority, application Fed. Rep. of Germany, May 26, 1981, 3120992

Int. Cl.³ C08L *27/04*

U.S. Cl. 525—215 4 Claims

1. A polychloroprene mixture containing a sol polymer and a gel polymer in a ratio, by weight, of from 1:4 to 9:1, wherein both polymers have been produced in the presence of from 2.5 to 4.0 parts, by weight, of the potassium salt of a disproportionated abietic acid expressed as acid, from 0.3 to 1.0 part, by weight, of a condensation product of naphthalene sulphonic acid and formaldehyde and from 0.2 to 1.5 parts, by weight, of potassium hydroxide, based in each case on 100 parts, by weight, of monomer, and wherein the gel polymer is a copolymer of chloroprene and from 1.5 to 2.5 mole percent, based on total monomer, of a diester corresponding to the following general formula:



wherein

R_1 and R_2 represent hydrogen, chlorine or C_1–C_4 alkyl; and X represents C_2–C_{10} alkylene and wherein the sol polymer is a homopolymer of chloroprene.

4,443,583

PROCESS FOR THE PRODUCTION OF CHLOROPRENE POLYMER MIXTURES

Rüdiger Musch, Bergisch-Gladbach; Gottfried Pampus, Cologne; Rudolf Casper, Leverkusen; Peter Müller, Kerpen, and Wilhelm Göbel, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 10, 1982, Ser. No. 386,883

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1981, 3123905

Int. Cl.³ C08L *11/00*

U.S. Cl. 525—215 5 Claims

1. A process for the production of polychloroprene mixtures of sol and gel polymers in a ratio, by weight, of from 1:4 to 9:1,

the gel polymer being produced by radical emulsion polymerization from chloroprene and from 1 to 4 mole percent, based on the molar quantity of chloroprene, of a diester of a dihydric alcohol and an acrylic acid in the presence of a potassium salt of, disproportionated abietic acid, in the presence of a condensation product of naphthalene sulphonic acid and formaldehyde and in the presence of potassium hydroxide and

the sol polymer being produced by radical emulsion polymerization from chloroprene in the presence of a the, disproportionated abietic acid, in the presence of a condensation product of naphthalene sulphonic acid and formaldehyde and in the presence of potassium hydroxide,

wherein the quantity of the, disproportionated abietic acid used in the production of the gel polymer amounts of from 4 to 10%, by weight, based on the quantity of monomer, the quantity of the, disproportionated abietic acid, used in the production of the sol polymer does not exceed 3.5%, by weight, based on the quantity of monomer, and the polychloroprene mixture contains at most 3.8%, by weight, based on the monomer total, of the, disproportionated abietic acid.

4,443,584

METHOD FOR PREPARING GRAFT POLYOLEFIN

Alain Michel, Villeurbanne, France, assignor to Centre National de la Recherche Scientifique, Paris, France

Filed Dec. 2, 1982, Ser. No. 446,326

Claims priority, application France, Dec. 3, 1981, 81 22802

Int. Cl.³ C08L *23/30, 51/06, 33/14*

U.S. Cl. 525—286 9 Claims

1. A method for preparing a polyolefin modified by grafting, in which in a first phase, peroxides are grafted in known manner onto a polyolefin chain with a mixture of oxygen and ozone, wherein, in a second phase, a vinyl monomer with at least one epoxy function selected from the group consisting of glycidyl methacrylate and acrylate is added to the resulting peroxidized polyolefin according to the dry blend mixing technique, and in a third phase, the resulting mixture is polymerized during a processing operation selected from the group consisting of passage through an internal mixer, passage through an extruder, passage over a calender or an injection press, or passage through a fluid bed.

4,443,585

DIENE/ACRYLATE BASED IMPACT MODIFIER FOR PVC

Theodore D. Goldman, Washington's Crossing, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 332,431, Dec. 21, 1981, abandoned. This application Jul. 12, 1983, Ser. No. 502,904

Int. Cl.³ C08F *279/02*

U.S. Cl. 525—310 10 Claims

1. An impact modifier composition having high efficiency at low levels and at low temperatures comprising a Stage A core polymer and two outer Stage polymers, B and C, said Stage A core polymer being a non-crosslinked, non-agglomerated polymer of at least 70% butadiene and at least 10% alkyl (C_2–C_8)acrylate, said Stage B polymer being at least 80% styrene, and said Stage C polymer containing at least 50% methyl methacrylate and at least 1% alkyl (C_1–C_4)acrylate, the ratio of Stages A:B:C being about 70–85:10–15:10–20, and the ratio of Stages C:B being at least 1.

4,443,586

TECHNIQUE FOR STABILIZATION OF VINYL CHLORIDE POLYMERS

William H. Starnes, Jr., Roselle Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 939,248, Sep. 5, 1978, abandoned, which is a continuation of Ser. No. 809,030, Jun. 22, 1977, abandoned. This application Jan. 10, 1980, Ser. No. 111,105

The portion of the term of this patent subsequent to Jun. 7, 1994, has been disclaimed.

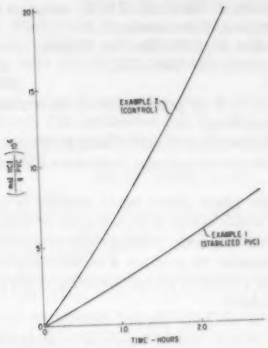
Int. Cl.³ C08F *8/42, 8/00*

U.S. Cl. 525—370 4 Claims

1. Method for preparing a polymer comprising reacting a polyvinyl chloride polymer with an organotin compound of the general formula

$R_2Sn(O_2CR')_2$

where R is a hydrocarbon radical having from 1–8 carbon atoms, and R′ is an alkyl group having from 5–11 carbon



atoms, and removing the residual organotin compound from the resulting mixture.

4,443,587

1,2,6-THIADIAZINE-3,5-DIONE-1,1-DIOXIDES AND THEIR USE AS POLYMERIZATION ACCELERATORS

Werner Schmitt; Robert Purrmann, both of Starnberg; Peter Jochum, Hechendorf; Heinz-Joachim Hübner, Wörthsee, and Bernd Burger, Hechendorf, all of Fed. Rep. of Germany, assignors to Abitz, Morf, Gritschneder, Fed. Rep. of Germany

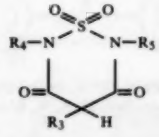
Filed Feb. 18, 1982, Ser. No. 349,769

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107577

Int. Cl.³ C08F *20/12, 20/20*

U.S. Cl. 526—146 **7 Claims**

1. In a method for the peroxidic polymerization of ethylenically unsaturated compounds selected from the group consisting of acrylic and methacrylic acid compounds useful in the formation of dental type molded articles including the steps of mixing such ethylenically unsaturated compounds with a peroxidic initiator and accelerator and polymerizing the resulting mixture in a mold, the improvement comprising use of a compound of the formula



wherein

R_4 and R_5 independently are alkyl, substituted alkyl, alkenyl, cycloalkyl, substituted cycloalkyl, aryl, or substituted aryl, and

R_3 is alkyl, substituted alkyl, alkenyl, or substituted cycloalkyl, as an accelerator.

4,443,588

HIGHLY REFRACTIVE URETHANE POLYMERS FOR USE IN OPTICAL LENSES AND LENSES PREPARED THEREFROM

Tadanori Fukuda, Ohtsu, and Tadayo Matsunaga, Hirakata, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

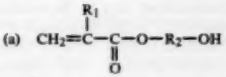
Filed Feb. 17, 1982, Ser. No. 349,647

Claims priority, application Japan, Feb. 19, 1981, 56-22194; Feb. 19, 1981, 56-22195

Int. Cl.³ C08F *26/02*

U.S. Cl. 526—301 **7 Claims**

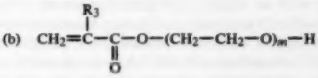
1. A lens having a refractive index n_D^{20} of more than 1.55 comprising a highly refractive, highly uniformly refractive, hard, thermosetting polymerization product of at least one unsaturated urethane compound, said unsaturated urethane compound being a reaction product of at least one xylylene diisocyanate with at least one compound selected from the group consisting of:



where:

R_1 is either H or CH_3; and

R_2 is a remnant radical of a substituent or non-substituent hydrocarbon having 2–4 carbon atoms;



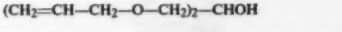
where:

R_3 is either H or CH_3; and

m=2-5;

(c)

and



(d).

4,443,589

ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE CELLULOSE ESTERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,281

Int. Cl.³ C08L *1/14, 1/10*

U.S. Cl. 527—300 **6 Claims**

1. An aqueous coating composition comprising the neutralized graft copolymer composition prepared by

polymerizing an acrylic monomer component comprising acrylic acid, methacrylic acid or both, in a solution which also comprises a solvent and a cellulose ester, under polymerization conditions in the presence of a free radical initiator selected from t-butyl perbenzoate and benzoyl peroxide, wherein said acrylic monomer component and said cellulose ester are employed in amounts sufficient to provide a graft copolymer composition having at least about 8 percent of its total weight derived from acrylic acid, methacrylic acid or both and sufficient to render said neutralized graft copolymer composition water dispersible;

neutralizing the graft copolymer composition with ammonia, ammonium hydroxide or a tertiary amine; adding a cross-linking agent; and adding sufficient water to disperse the composition.

4,443,590

COMPOSITION FOR POLYURETHANE RESINS AND PRODUCTION OF THE SAME

Yoshio Kamatani, Osaka; Michio Tanaka, Shizuoka, and Kyuya Yamazaki, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 390,883, Jun. 22, 1982, abandoned. This application Dec. 29, 1982, Ser. No. 454,490

Claims priority, application Japan, Jul. 1, 1981, 56-103697; Dec. 23, 1981, 56-208433

Int. Cl.³ C08G *18/78, 18/16, 18/18, 18/22*

U.S. Cl. 528—51 45 Claims

1. A polyurethane composition kit, curable at ambient temperature, which comprises an isocyanate component having oxadiazinetrione ring, an active hydrogen component containing at least two active hydrogens and having a molecular weight of 400 to 100,000 and a Lewis base whose basic site has no hydrogen active to NCO group, the proportion of the isocyanate component to the active hydrogen component being such that the ratio of the total number of isocyanate group and oxadiazinetrione ring to the number of active hydrogen is in a range of 0.1 to 10, the amount of said Lewis base being in a range of about 0.001 to 10% by weight based on the weight of non-volatile matter in said isocyanate component and said active hydrogen component; said isocyanate component and said active hydrogen component being separated from each other until actual use whereupon all components are admixed to form a polyurethane resin at ambient temperature.

18. A process for producing polyurethane resin which comprises reacting an isocyanate component having oxadiazinetrione ring with an active hydrogen component containing at least two active hydrogens and having a molecular weight of 400 to 100,000 at ambient temperature in the presence of a Lewis base whose basic site has no hydrogen active to NCO group, the proportion of the isocyanate component to the active hydrogen component being such that the ratio of the total number of isocyanate group and oxadiazinetrione ring to the number of active hydrogen is in a range of 0.1 to 10, an amount of the Lewis base being in a range of about 0.001 to 10% by weight based on the weight of nonvolatile matter in said active hydrogen component and said isocyanate component.

4,443,591

METHOD FOR MAKING POLYETHERIMIDE

Lawrence R. Schmidt, Schenectady, and Eric M. Lovgren, Westerlo, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,849

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—128 25 Claims

1. A process for the continuous polymerization of polyetherimide which comprises

(1) dry-blending aromatic bis(ether anhydride) and organic diamine,

(2) feeding the resulting solids into an extruder,

(3) conveying the solids to a melting stage in the extruder, where they are kneaded and melted via viscous heating at a temperature in the range of from about 50° C. to about 300° C. resulting in the production of a liquid pool,

(4) conveying the liquid of (3) to a mass transfer stage where water of reaction is vented to the atmosphere at temperatures of from 200° C. to 350° C.,

(5) conveying the resulting melt from the mass transfer stage of (4) to an advanced polymerization stage where the melt is further subjected to higher shear and intensive mixing at a temperature in the range of from 300° C. to 400° C. while being subjected to pressures of 1 atmospheres to 25 atmospheres, and

(6) and thereafter separating from the extruder polyetherimide and additional water of reaction.

4,443,592

METHOD FOR MAKING POLYETHERIMIDE

Lawrence R. Schmidt, Schenectady; Eric M. Lovgren, Westerlo, and Peter G. Meissner, Berne, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1983, Ser. No. 459,850

Int. Cl.³ C08G *73/10*

U.S. Cl. 528—128 27 Claims

1. A process for making polyetherimide in a continuous manner which comprising

(1) feeding molten aromatic bis(ether anhydride) and molten organic diamine into an extruder to produce a plural phase viscous melt,

(2) conveying the plural phase liquid mixture of (1) to a mixing stage which effects a high degree of contact between the molten aromatic bis(ether anhydride) and molten organic diamine to produce a substantially uniform viscous melt as a result of intense kneading of the ingredients of the mixture,

(3) conveying the resulting viscous melt of (2) to a mass transfer stage, where water of reaction is separated from the surface of the partially polymerized polyetherimide melt,

(4) thereafter conveying the resulting melt to high shear and intensive mixing at a temperature in the range of from 250° C. to 350° C. and a pressure of from 1 to 5 atmospheres, and

(5) separating high molecular weight polyetherimide therefrom along with the removal of final water of reaction,

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4,443,593

SALVAGE OF POLYCARBONATE WASTES BY CONVERSION TO MONOMERIC HYDROXYCARBAMOYL PHENOLS

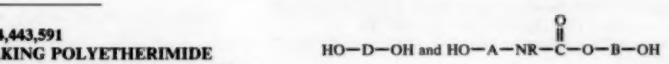
Guy R. Collins, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jun. 25, 1982, Ser. No. 392,399

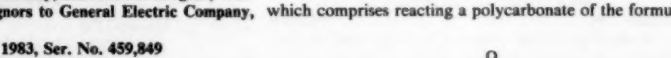
Int. Cl.³ C08G *63/62*

U.S. Cl. 528—210 10 Claims

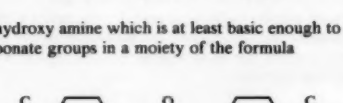
1. The method of preparing a reaction mixture containing monomers of the formulas



which comprises reacting a polycarbonate of the formula



with a hydroxy amine which is at least basic enough to cleave the carbonate groups in a moiety of the formula



at a temperature of about 100° C. or less and is of the formula RNH—A—OH, the symbols D, A, R, R′ and n being defined as follows:

D and A are divalent organic radicals,

R is H or a non-interfering radical,

R′, independently in each occurrence is H or a non-interfering radical, and

n is an integer greater than 1,

the amount of said amine employed being enough to react out essentially all of the carbonate groups in said polycarbonate.

4,443,594

PROCESS FOR THE PRODUCTION OF ADENINE RING SYSTEM CONTAINING CO-ENZYMES BOUND TO MACROMOLECULES

Andreas Bückmann, Braunschweig-Stöckheim, Fed. Rep. of Germany, assignor to Gesellschaft fur biotechnologische forschung mbH (GBF), Braunschweig-Stockholm, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 73,317, Sep. 7, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,249
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841414
Int. Cl.³ C07H *19/20*
U.S. Cl. 536—27 3 Claims

1. A process for the production of an adenine ring system containing co-enzymes bound to a macro-molecular carrier consisting essentially of:

(a) reacting a co-enzyme selected from the group consisting of AMP, ADP, ATP, NAD$^+$ and NADP, said co-enzyme having an adenine ring system substituted by an alkylene chain in the 1 position, said alkylene chain containing from 1 to 3 carbon atoms and a functional group capable of reacting with a macromolecular carrier selected from the group consisting of carboxyl, hydroxyl, —NH_2 and vinyl, with a macro-molecular carrier selected from the group consisting of dextrans, polyetherpolyols, polyethyleneimines, polyacrylamides and poly-(methylvinylether/-maleic acid anhydride), said carrier having groups capable of reacting with said functional group,

(b) subjecting said alkylated co-enzyme bound to said macro-molecular carrier to a Dimroth rearrangement into the N^6-form of substitution, and

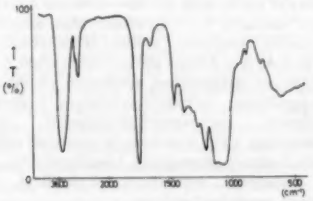
(c) recovering said N^6-substituted co-enzyme bound to said macro-molecular carrier.

4,443,595

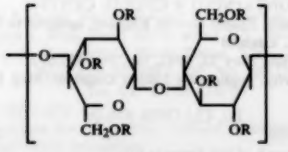
CELLULOSE ESTER DERIVATIVES AND A PROCESS FOR THE PRODUCTION THEREOF

Hajime Namikoshi; Yoshiaki Okumura, and Tsuyoshi Sei, all of Himeji, Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Jun. 13, 1983, Ser. No. 503,677
Claims priority, application Japan, Jun. 22, 1982, 57-107825
Int. Cl.³ C08B *15/00*
U.S. Cl. 536—58 11 Claims

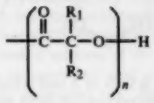


1. A cellulose ester derivative containing at least a moiety of the general formula (I):



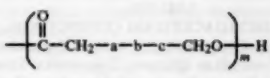
(I)

wherein at least one of the R groups is either a group of the formula (II):



(II)

wherein R_1 and R_2 are independent from each other and each represents a hydrogen atom or a lower alkyl group and n represents an even number of 2–10; or a group of the formula (III):



(III)

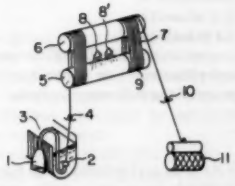
wherein a, b and c are independent from one another and each represents an oxygen atom or a methylene group, except the case where the oxygen atoms are adjacent to each other, and m represents an integer of 1–5; these groups optionally being present as a mixed ester, and the rest of the R groups represent hydrogen atoms.

4,443,596

VISCOSE RAYON FILMENT YARN AND PROCESS FOR PRODUCING SAME

Yasuo Isome; Toshio Minami, and Tadahiko Takahashi, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan and SNIA Viscosa S.p.A., Milan, Italy

Division of Ser. No. 187,935, Sep. 17, 1980, Pat. No. 4,383,962. This application Sep. 14, 1982, Ser. No. 417,959
Claims priority, application Japan, Sep. 27, 1979, 54-123114; Oct. 8, 1979, 54-128890
Int. Cl.³ C08B *9/00*
U.S. Cl. 536—60 1 Claim



1. A continuous viscose rayon filament yarn package exhibiting uniform boiling water shrinkage in longitudinal direction, the yarn having a high resistance to deterioration with time, a content of free sulfur not greater than 0.04% based on the weight of yarn and not smaller than 0.02% based on the weight of yarn and a content of sodium hydroxide or sulfuric acid not greater than 0.04% based on the weight of yarn.

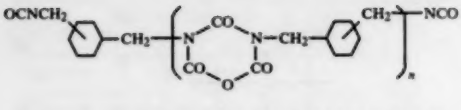
4,443,597

POLYISOCYANATES

Yoshio Kamatani, and Noriaki Fujita, both of Osaka, Japan, assignors to Takeda Chemical Industries, Inc., Osaka, Japan

Continuation of Ser. No. 269,961, Jun. 3, 1981, abandoned. This application Nov. 30, 1982, Ser. No. 445,581
Claims priority, application Japan, Jun. 23, 1980, 55-85486
Int. Cl.³ C07D *273/04*
U.S. Cl. 544—67 10 Claims

2. A polyisocyanate having an oxadiazinetrione ring which is represented by the following generic formula:



wherein an average of n is 0.01 to 5 and which is obtained by reacting bis(isocyanatomethyl)cyclohexane with carbon dioxide at a temperature ranging from −40° C. to 70° C.

4,443,598

1-OXADETHIACEPHAM COMPOUNDS

Mitsuru Yoshioka; Uyeo Shoichiro, both of Toyonaka; Yoshio Hamashima, Kyoto; Ikuo Kikkawa, Takarazuka; Teruji Tsuji, Takatsuki, and Wataru Nagata, Nishinomiya, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

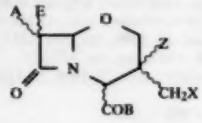
Continuation-in-part of Ser. No. 322,662, Nov. 18, 1981, Pat. No. 4,366,316, which is a continuation of Ser. No. 72,600, Sep. 5, 1979, abandoned, which is a continuation of Ser. No. 877,811, Feb. 14, 1978, abandoned. This application May 4, 1982, Ser. No. 374,862

Claims priority, application Japan, Feb. 15, 1977, 52-15813; Jun. 7, 1977, 52-67025

Int. Cl.³ C07D *498/04*

U.S. Cl. 544—90 **4 Claims**

1. A compound of the formula



wherein

A is amino substituted by

(1) C_1 to C_{10} alkanoyl,

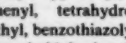
(2) C_1 to C_7 haloalkanoyl,

(3) azidoacetyl, cyanoacetyl, trifluoromethylthioacetyl, cyanomethylthioacetyl, or (4-pyridon-1-yl)acetyl;

(4) acyl group of the following formula:

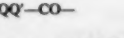
wherein Ar is an aryl selected from furyl, thienyl, pyrrolyl, oxazolyl, isoxazolyl, oxadiazolyl, oxatriazolyl, thiazolyl, isothiazolyl, thiadiazolyl, thiatriazolyl, pyrazolyl, imidazo. , triazolyl, tetrazolyl, phenyl, pyridyl, pyrimidyl, pyrazinyl, pyridazinyl, triazinyl, dihydrophenyl, tetrahydrophenyl, tetrahydropyrimidyl, naphthyl, benzothiazolyl, indolyl, quinolyl, isoquinolyl, benzopyrimidyl, cinnolinyl, pyridopyrimidyl, or indanyl ring group;

(5) acyl group of the following formula:



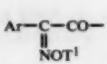
wherein Ar is as defined above and Q and Q′ each is hydrogen or methyl;

(6) acyl group of the following formula:



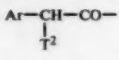
wherein Ar, Q, and Q′ each is as defined above and G is oxygen, sulfur, or imino;

(7) acyl group of the following formula:

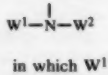


wherein Ar is as defined above and T^1 is hydrogen or C_1 to C_6 alkyl;

(8) acyl group of the following formula:



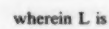
wherein Ar is as defined above and T^2 is one of (i) hydroxy or C_1 to C_{10} acyloxy, (ii) carboxy or protected carboxy, (iii) sulfo or C_1 to C_5 alkoxysulfonyl, or a group of the formula:



in which W^1 and W^2 each is hydrogen or a C_1 to C_{15} aminosubstituent;

(9) 5-aminoadipoyl, 5-aminoadipoyl protected at the amino or 5-aminoadipoyl protected at the carboxy;

(10) acyl group of the following formula:



wherein L is an easily removable and unsubstituted or substituted C_1 to C_{10} hydrocarbyl group; or

(11) C_1 to C_{20} optionally substituted hydrocarbyl, C_3 to C_{10} organic silyl, or C_1 to C_{10} sulfenyl, the carboxy protecting group B in said COB is C_1 to C_{10} alkoxy, C_1 to C_6 haloalkoxy, C_3 to C_{10} acylalkoxy, C_3 to C_{10} alkoxyalkoxy, C_2 to C_{10} aminoalkoxy, aryloxy, aralkoxy, C_1 to C_{10} alkylsilyloxy, C_1 to C_{10} alkylstannyloxy, C_1 to C_{10} acyloxy, inorganic acyloxy, metal oxy of a group I, II, or III metal in the periodical table, C_1 to C_{15} hydrocarbylammoniooxy, C_1 to C_{10} hydrocarbylthio or mercapto, C_1 to C_5 alkylamino, di-C_1 to C_5 alkylamino, hydrazinyl, or azido;

E is β-hydrogen or α-methoxy;

X is hydrogen, halo, hydroxy, C_1 to C_4 alkanoyloxy, substituted C_1 to C_4 alkanoyloxy, aroyloxy, carbonic acyloxy, C_1 to C_6 alkoxy, aralkoxy of the formula Ar—CH_2O— or aryloxy of the formula Ar—O— in which Ar is as defined above, mercapto, C_1 to C_5 alkanoylthio, aroylthio, C_1 to C_6-alkylthio, aralkylthio, arylthio of the formula Ar—S— in which Ar is as defined above, amino, azido, hydrazinyl, acetylamino, methylamino, pyridinium, picolinium, 4-carboxypyridinium, carbamoylpyridinium, hydroxymethylpyridinium, carboxymethylpyridinium, or chloropyridinium, COB is carboxy or protected carboxy, and

Z is halo, hydroxy, alkanoyloxy, haloalkanoyloxy, arylsulfenyl, arylselenyl, arylsulfinyl, alkylsulfinyl, alkanesulfonyloxy, or arylsulfonyloxy.

4,443,599

8-OXO-3-OXA-1-AZABICYCLO[4.2.0]OCTANES CONTAINING A CHIRAL CENTER

Terence C. Smale, Epsom Downs, England, assignor to Beecham Group p.l.c., England

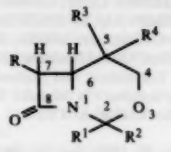
Filed May 12, 1982, Ser. No. 377,697

Claims priority, application United Kingdom, May 14, 1981, 8114848

Int. Cl.³ C07D *498/04*

U.S. Cl. 544—90 **3 Claims**

1. A compound of the formula (I)



(I)

wherein R is acetyl, α-hydroxyethyl or a protected derivative thereof, and R^1 and R^2 are hydrocarbon groups, or are joined so as to form a carbocyclic or heterocyclic ring, where the carbocyclic or heterocyclic ring contains from 3 to 8 ring atoms and the heterocyclic ring contains two or three heteroatoms selected from oxygen, nitrogen and sulphur any of said R^1 and/or R^2 groups being unsubstituted or substituted by hydroxy, bromine, chlorine, fluorine, carboxylic acid or salt or ester thereof, azido, tetrazolyl, alkanoyl, alkanoyloxy, aroyloxy, aroyl, aralkanoyloxy, aroxy, amino, protected amino, nitro, C_{1-6} alkoxy, C_{1-6} alkyl, aryl, C_{1-6} alkylthio and arylthio, at least one of R^1 and R^2 containing a chiral centre; and R^3 and R^4 are independently hydrogen, a hydrocarbon group, a heterocyclyl group or heterocyclyl (C_{1-6}) alkyl wherein the heterocyclic rings contain 1 to 4 heteroatoms selected from oxygen, nitrogen and sulphur atoms, said groups bonded via a carbon atom to the tetrahydro-oxazine ring, or R^3 and R^4 are joined so as to form together with the carbon atom to which they are attached an C_{3-7} cycloalkyl ring.

3. An enantiomer of a compound of the formula (I) as claimed in claim 1.

4,443,600

SURFACTANT WASHING OF POLYCHLOROISOCYANURIC ACIDS

Wayne H. Hammond, and George V. Jones, both of Lake Charles, La., assignors to Olin Corporation, New Haven, Conn.

Filed Jul. 6, 1982, Ser. No. 395,181
Int. Cl.³ C07D *251/36*
U.S. Cl. 544—190 **10 Claims**

1. In a process for the production of polychloroisocyanuric acid by the reaction of chlorine gas with a cyanuric compound selected from the group consisting of cyanuric acid, alkali metal cyanurates and alkaline earth metal cyanurates in a reaction mixture, and recovering said polychloroisocyanuric acid from said reaction mixture, said recovery comprising filtration to produce a filter cake, washing said cake with water, and drying said cake, the improvement which comprises adding a foam depressant selected from the group consisting of ethoxylated alcohols, alkoxylated alcohols and alkali metal salts of esters of dicarboxylic acids to said reaction mixture in an amount of between about 5 and about 500 ppm and further adding a surfactant wetting agent to said wash water selected from the group consisting of alkali metal dialkyl sulfosuccinates, sodium alkyl naphthalene sulfonates, sodium N acyl N alkyltaurates, sodium alkyl sulfates, sulfated ester, sulfoxylated alkyl phenols, ethoxylated alkyl phenols, alkoxylated alkyl phenols, ethoxylated alkyl alcohols, alkoxylated aliphatic alcohols and alkoxylated glycols.

4,443,601

RECOVERY OF CAFFEINE FROM CAFFEINE ADSORBENTS

Mark H. Karmiol, Warwick; Gary L. Hickernell, Ossining, and Bertrand J. Hall, Pearl River, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Sep. 20, 1982, Ser. No. 420,158
Int. Cl.³ C07D *239/96*
U.S. Cl. 544—274 **11 Claims**

1. A process for recovering caffeine adsorbed on a caffeine adsorbent which comprises:

(a) contacting a caffeine adsorbent having at least caffeine adsorbed thereon with a solvent selected from the group consisting of ethylene carbonate, propylene carbonate, aqueous solution of ethylene carbonate or propylene carbonate and any combination thereof;

(b) maintaining the contact between the caffeine adsorbent and the solvent at a temperature between 20° C. and 200° C. until at least a portion of the coffee adsorbed on the adsorbent is removed into said solvent;

(c) subsequently separating the caffeine adsorbent from the caffeine-containing solvent.

4,443,602

TRANS-1,4,5,8-TETRANITRO-1,4,5,8-TETRAAZADECALIN

Rodney L. Willer, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 16, 1982, Ser. No. 349,134
Int. Cl.³ C07D *487/22*
U.S. Cl. 544—350 **1 Claim**

1. Trans-1,4,5,8-tetranitro-1,4,5,8-tetraazadecalin.

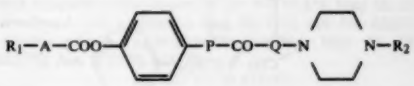
4,443,603

PIPERAZINE DERIVATIVES, OF AROMATIC ACIDS

Setsuro Fujii, Toyonaka; Eizou Hattori, Sakado; Mitsuteru Hirata, Saitama; Koichiro Watanabe, and Hiroshi Ishihama, both of Higashi-Murayama, all of Japan, assignors to Kowa Company Limited, Nagoya, Japan

Filed May 24, 1982, Ser. No. 381,443
Claims priority, application Japan, Jun. 5, 1981, 56-86569
Int. Cl.³ C07D *403/12, 241/04*
U.S. Cl. 544—373 **5 Claims**

1. A piperazine derivative represented by the following formula:



wherein

R_1: an indolyl group which may optionally be substituted by one or more lower alkyl and/or lower alkoxy groups, naphthyl group which may optionally be saturated partially with 2 or 4 hydrogen atoms, or phenyl or cyclohexyl group which may optionally be substituted by one or more lower alkyl groups;

A: a single bond or lower alkylene group;

P: a single bond or vinylene group;

Q: an —O—lower alkylene group or —NH—lower alkylene group when P is a single bond, or a single bond when P is a vinylene group; and

R_2: a lower alkyl, morpholino-lower alkyl, morpholinocarbonyl lower alkyl, piperidinocarbonyl lower alkyl, piperazinocarbonyl lower alkyl or lower alkylaminocarbonyl lower alkyl group,

or a pharmaceutically acceptable acid addition salt thereof.

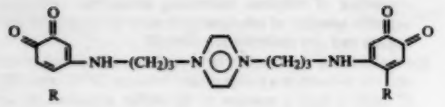
4,443,604

1,4,BIS-N,N'-DIPOLYALKYLQUINONYL AMINOPROPYL PIPERAZINE

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 62,333, Jul. 31, 1979, Pat. No. 4,362,668, which is a division of Ser. No. 955,930, Oct. 30, 1978, Pat. No. 4,208,340. This application Jun. 15, 1982, Ser. No. 388,609
Int. Cl.³ C07D *295/10*
U.S. Cl. 544—399 **1 Claim**

1. A bis-aminopropylpiperazine derivative of alkylated ortho-quinone having the structure:



wherein R is an aliphatic hydrocarbyl chain of at least 12 carbon atoms selected from the group consisting of an alkyl of at least 12 carbon atoms and a polymer of an olefin of at least 3 carbon atoms.

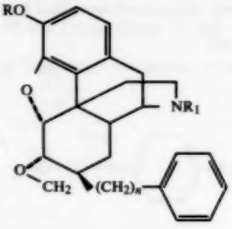
4,443,605

7β-ARYLALKYL-6α, 7 α-OXYMETHYLENE-3-METHOXY OR 3-HYDROXY-4, 5α-EPOXY-17 METHYL OR 17-CYCLOALKYL-METHYL MORPHINANS

Michael P. Kotick, and David L. Leland, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jul. 30, 1982, Ser. No. 403,464
Int. Cl.³ C07D *489/02*; A61K *31/485*
U.S. Cl. 546—39 **20 Claims**

1. 7β-arylalkyl-6α,7α-oxymethylene-3-methoxy or 3-hydroxy-4,5α-epoxy-17-methyl or 17-cycloalkylmethyl-morphinans characterized by the formula:



wherein R is H or methyl, R_1 is methyl, cyclopropylmethyl or cyclobutylmethyl and n is 2 to 5.

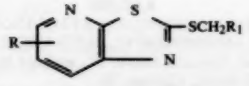
4,443,606

ANTIVIRAL THIAZOLO [5,4-b] PYRIDINE COMPOUNDS

Peter H. L. Wei, Springfield, and Stanley C. Bell, Penn Valley, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jun. 16, 1982, Ser. No. 388,856
Int. Cl.³ C07D *513/04*
U.S. Cl. 546—114 **2 Claims**

1. A compound of the formula



wherein R is hydrogen, chlorine or bromine, and

R_1 is CN or $-C(=NOH)-NH_2$.

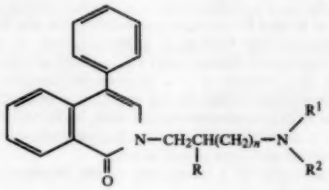
4,443,607

1(2H)-ISOQUINOLONE COMPOUNDS AND ACID ADDITION SALTS THEREOF

Shigeo Senda; Osamu Ohtani, both of Gifu; Eiichi Katho; Mitsuaki Nagasaka, both of Aichi; Hidekazu Miyake, Tokushima; Khosuke Fujiwara, Tokushima, and Motoaki Tanaka, Tokushima, all of Japan, assignors to Maruko Seiyaku Co., Ltd., Aichi and Taiho Pharmaceutical Co., Ltd., Tokyo, both of, Japan

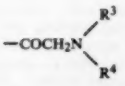
Filed Mar. 25, 1982, Ser. No. 361,935
Claims priority, application Japan, Mar. 28, 1981, 56-44700; Mar. 4, 1982, 57-33015
Int. Cl.³ C07D *217/24*
U.S. Cl. 546—141 **4 Claims**

1. A 1(2H)-isoquinolone compound represented by the formula (I)



(I)

wherein n is 0 or an integer of 1, R represents a methyl group or a hydroxy group, R^1 represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 3 to 4 carbon atoms, or an alkynyl group having 3 to 4 carbon atoms, and R^2 represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkenyl group having 3 to 4 carbon atoms, an alkynyl group having 3 to 4 carbon atoms, a benzyl group, an ethoxycarbonyl group, a mono- or dialkylcarbamoyl having 1 to 4 carbon atoms in each alkyl group, an acetyl group, a mono- or dialkylaminoethoxyacetyl group or a group of the formula



wherein R^3 and R^4, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, a hydroxyalkyl group having 2 to 4 carbon atoms or an allyl group, or R^3 and R^4, when taken together with nitrogen atom to which they are attached, represent a heterocyclic group selected from the group consisting of a pyrrolidino group, a piperazino group, a 4-methylpiperazino group, a piperidino group and a morpholino group, with the proviso that, when R represents a methyl group,

cannot be a monoalkylamino group or a dialkylamino group and when R represents a hydroxy group, n represents an integer of 1; and the acid addition salt thereof.

4,443,608

(+),(−)-TROPICAMIDE O-β-B-GLUCURONIC ACID, ITS DIASTEREOMERS, AND SALTS THEREOF

Walter C. Herlihy, Cambridge, and Thomas H. Fraser, Newtonville, both of Mass., assignors to Repligen Corporation, Cambridge, Mass.

Filed May 24, 1982, Ser. No. 381,528
Int. Cl.³ C07H 15/26
U.S. Cl. 546—268 6 Claims

1. (+),(−)-Tropicamide O-β-D-glucuronic acid in its essentially pure form, and base addition salts thereof.

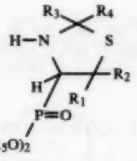
4,443,609

TETRAHYDROTHIAZOLE PHOSPHONIC ACIDS OR ESTERS THEREOF

Bernardus A. Oude Alink, St. Louis, and Derek Redmore, Webster Groves, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed May 19, 1980, Ser. No. 151,051
Int. Cl.³ C07F 9/65
U.S. Cl. 548—111 5 Claims

1. A tetrahydrothiazole phosphonic acid or phosphonate of the formula



where R_1, R_2, R_3 and R_4 are H, alkyl, cycloalkyl, aryl or aralkyl and R_5 is alkyl, aryl, H or a cation.

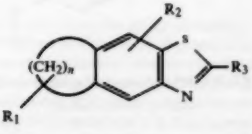
4,443,610

BICYCLOTHIAZOLES

Fu-chih Huang, Boonton, N.J., assignor to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Division of Ser. No. 285,216, Jul. 7, 1981, Pat. No. 4,368,201. This application Sep. 20, 1982, Ser. No. 420,157
Int. Cl.³ C07D 277/84; A61K 31/415
U.S. Cl. 548—150 2 Claims

1. A compound of the structure



wherein
n is 3, 4, or 5
R_1 is hydrogen or C_1–C_6 alkyl,
R_2 is hydrogen, C_1–C_6 alkyl, hydroxyl, C_1–C_6 alkoxy, cyano, phenyl, carboxyl, tetrazole, or halogen,
R_3 is tetrazole, carboxamide or —C—OR_4 wherein Z is oxygen, sulfur, or NH and
R_4 is H, alkali metal, ammonium, C_1–C_6 alkyl, C_1–C_6 alkoxy C_1–C_6 alkyl, C_6 aryl, or C_6 aryl C_1–C_6 alkyl.

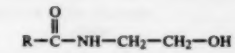
4,443,611

LIQUID PHASE PREPARATION OF 2-H-2-OXAZOLINES AND 2-SUBSTITUTED-2-OXAZOLINES

Mark E. Kaiser, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 966,698, Dec. 5, 1978, abandoned, which is a continuation-in-part of Ser. No. 758,239, Jan. 10, 1977, abandoned, and a continuation-in-part of Ser. No. 875,280, Feb. 6, 1978, abandoned, and a continuation-in-part of Ser. No. 756,155, Jan. 3, 1977, abandoned. This application Sep. 7, 1982, Ser. No. 415,077
Int. Cl.³ C07D 207/20
U.S. Cl. 548—239 8 Claims

1. A cyclodehydration process for making a 2-R-2-oxazoline wherein R is hydrogen, a hydrocarbyl or an inertly-substituted hydrocarbyl, which comprises the steps of reacting by contacting in liquid phase, an N-(2-hydroxyalkyl)carboxamide corresponding to the formula:



wherein R is as defined above, or a carboxylic acid/amine salt precursor of said N-(2-hydroxyethyl)carboxamide with a small but catalytic amount of an inorganic zinc salt of sulfuric, nitric, hydrochloric, hydrobromic, hydroiodic, phosphoric or hypophosphorous acid.

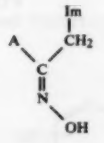
4,443,612

PROCESS FOR THE STEREOSPECIFIC PREPARATION OF IMIDAZOLYL OXIMES

Georg Mixich, and Kurt Thiele, both of Zofingen, Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

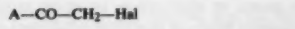
Continuation of Ser. No. 211,172, Nov. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 40,425, May 18, 1979, abandoned. This application Aug. 30, 1982, Ser. No. 412,943
Claims priority, application Switzerland, May 24, 1978, 5653/78; Jan. 9, 1979, 161/79
Int. Cl.³ C07D 233/61
U.S. Cl. 548—341 1 Claim

1. A process for the stereospecific production of a substantially pure imidazolyl oxime stereoisomer having the formula



(II$_c$)

wherein
A signifies a phenyl with from zero to two halogeno substituents, and
Im signifies a 1-H-imidazol-1-yl group that is substituted with zero to two substituents selected from the class consisting of halogeno and C_1–C_4 alkyl
which process comprises:
(a) first reacting a 2-halogen ethanone of the formula



(IV)

wherein Hal is a halogen and A has the meaning given above, with imidazole or a substituted imidazole containing the substituents as given above for Im thereby forming the corresponding 2-(imidazol-1-yl) derivative of the halogen ethanone (IV),
(b) then heating said imidazolyl derivative in alcoholic solution with hydroxylamine or a hydroxylamine-yielding compound in the presence of an amount of an alkali corre-

sponding to a molar excess relative to said hydroxylamine and hydroxylamine-yielding compound, respectively, to produce a substantially pure cis-oxime stereoisomer of formula (II_c), and

(c) recovering said cis-oxime stereoisomer.

4,443,613

IMINO-ALKYL AND AMINO-NITRILE CYANO-GUANIDINE

Pierre J. Baudet, 15 ch. Passoret, Geneva 1227, Switzerland

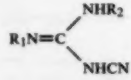
Division of Ser. No. 197,985, Oct. 14, 1980, Pat. No. 4,383,115. This application Sep. 30, 1982, Ser. No. 428,748

Claims priority, application Switzerland, Feb. 14, 1979, 1404/79

Int. Cl.³ C07D *233/64*

U.S. Cl. 548—342 **1 Claim**

1. A cyanoguanidine having the structural formula:



characterized by the imino-alkyl and amino-nitrile structure wherein R_1 comprises a 2-((4-methyl-5-imidazolyl)dithioformyloxy-methyl)ethyl radical and R_2 comprises a methyl radical.

4,443,614

TRIARYLMETHANE DERIVATIVES

Mitsuru Kondo, Kawanishi; Kiyoshi Yasui, Motomachi; Makoto Miyake, Hyogo; Hiroshi Iwasaki, Kawanishi, and Tetsuo Shiraishi, Hyogo, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 774,613, Mar. 4, 1977, which is a division of Ser. No. 699,584, Jun. 24, 1976, Pat. No. 4,045,458. This application Jun. 24, 1980, Ser. No. 162,659

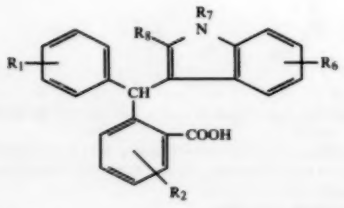
Claims priority, application Japan, Jul. 3, 1975, 50-82898

The portion of the term of this patent subsequent to Mar. 27, 2001, has been disclaimed.

Int. Cl.³ C07D *209/04*

U.S. Cl. 548—469 **8 Claims**

1. Triarylmethane derivative having the structural formula:



wherein each R_1 and R_2 represent at least one of hydrogen, halogen, a nitro group, an alkyl group, an amino group, an alkyl-, benzyl-, phenyl-, tolyl-, or pentylene-substituted amino group, a hydroxyl group, an alkyl-substituted hydroxyl group, a thiohydroxyl group or an alkyl-substituted thiohydroxyl group, R_6 represents at least one of hydrogen, halogen, lower alkyl group, lower alkoxyl group, amino group, lower alkyl-amino group, nitro group, phenyl group or phenoxy group, R_7 represents hydrogen, an alkyl group, an aralkyl group or a phenyl group, R_8 represents an alkyl group or alkyl-, halogen-, or alkoxy-substituted or unsubstituted phenyl group.

4,443,615

PROCESS FOR PREPARING INDOLES

Manabu Matsuoka, Toyonaka; Michihiro Tsuchiya, Suita, and Yoshikazu Tokuda, Toyonaka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

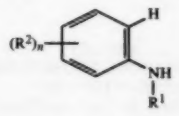
PCT No. PCT/JP80/00146, 371 Date Nov. 10, 1981, 102(e) Date Nov. 10, 1981, PCT Pub. No. WO82/00032, PCT Pub. Date Jan. 7, 1982

PCT Filed Jun. 25, 1980, Ser. No. 325,436

Int. Cl.³ C07D *209/08*

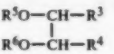
U.S. Cl. 548—489 **8 Claims**

1. A process for preparing an indole which consists essentially of reacting in the vapor phase an aniline of the formula



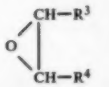
(I)

wherein R^1 is hydrogen, alkyl, aryl or aralkyl, R^2 is alkyl or alkoxy, and n is an integer of 0 to 4, with a glycol of the formula:



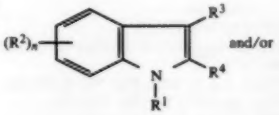
(II)

wherein R^3 and R^4 are the same or different and stand for hydrogen or alkyl, and R^5 and R^6 are the same or different and stand for hydrogen or alkyl, or an oxide of the formula:

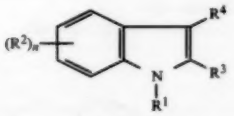


(II')

wherein R^3 and R^4 are the same as defined above, at 250° to 400° C. in the presence of a solid acid catalyst selected from the group consisting of silica, alumina, and silica-alumina to give an indole of the formula:



(III)



(III')

wherein R^1, R^2, R^3, R^4 and n are the same as defined above.

4,443,616

PRODUCTION OF 3-PYRROLIN-2-ONES

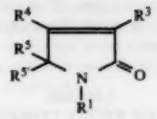
Peter Hofer, Liestal, Switzerland, assignor to The Purdue Frederick Company, Norwalk, Conn.

Continuation of Ser. No. 12,496, Feb. 15, 1979, abandoned, and a continuation-in-part of Ser. No. 914,682, Jun. 12, 1978, abandoned. This application Apr. 21, 1981, Ser. No. 256,169

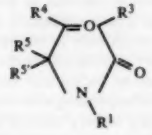
Int. Cl.³ C07D *207/38*

U.S. Cl. 548—543 **3 Claims**

1. Method of producing a 3-pyrrolin-2-one of the formula:



wherein R^1 is hydrogen, lower alkyl, phenyl or phenyl substituted by lower alkyl, R^3 is hydrogen, lower alkyl, phenyl, or phenyl substituted by halogen, carboxyl, lower alkyl, halo-lower-alkyl or lower alkoxy, with R^3 being other than hydrogen or alkyl when R^1 is hydrogen, R^4 is phenyl, or phenyl substituted by halogen, carboxyl, lower alkyl, halo-lower-alkyl or lower alkoxy, R^5 is hydrogen or lower alkyl, and $R^{5'}$ is hydrogen or lower alkyl, one of the substituents R^5 and $R^{5'}$ being hydrogen, which comprises the steps of refluxing under nitrogen, in the presence of equimolar amounts of KO C $(CH3)_3$ in t-butanol a compound of the formula:



wherein R^1, R^3, R^4, R^5 and $R^{5'}$ have the same definitions as above, until the reaction is complete, acidifying the reaction mass, and separating the formed 3-pyrrolin-2-one therefrom.

4,443,617

PROCESS FOR THE PREPARATION OF DERIVATIVES OF 6,6-DIMETHYL-4-HYDROXY-3-OXABICYCLO-[3,1,0]-HEXAN-2-ONE

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

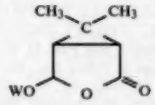
Division of Ser. No. 153,338, May 27, 1980. This application Jul. 1, 1982, Ser. No. 394,457

Claims priority, application France, Jun. 6, 1979, 79 14425

Int. Cl.³ C07D *307/93*

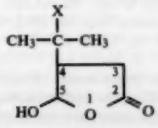
U.S. Cl. 549—302 **8 Claims**

1. A process for the preparation of a compound of the formula



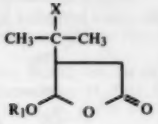
V

wherein W is selected from the group consisting of hydrogen and R_1 is derived from an optionally aliphatic chiral alcohol of 1 to 12 carbon atoms optionally substituted with halogen, aryl or heterocycle consisting essentially of reacting 3-formyl-4-methyl-pent-3-ene-1-oic acid under anhydrous conditions with a hydrogen halide in the presence of LiX wherein X is halogen in an organic solvent to obtain a compound of the formula



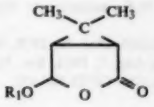
VI

reacting the latter with an achiral alcohol R_1OH to obtain a racemic compound of the formula



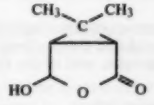
VII

which, together with the compound of formula VI has a trans relationship with the 4 and 5 substituents of the tetrahydrofuranone or with a chiral alcohol R_1OH, compound VII will be a mixture of two predictable diastereoisomers which may be separated into the individual isomers by physical methods and then reacting the compound of formula VII in its racemic form when R_1 is achiral or in the form of one of its optically active isomers where R_1 is chiral with a basic agent to obtain the bicyclic compound of the formula



V'

in its racemic form or one of its 2 enantiomeric forms when R_1 is an achiral or a chiral group, respectively, the absolute configuration of the 4-position as well as the following 1- and 5-positions being determined by the stereochemistry of the diasteroisomer of formula VII and optionally subjecting the compound of formula V' to hydrolysis in an acid medium with total retention of the absolute configurations to obtain a compound of the formula



V''

4,443,618

FUNGICIDAL COMPOUNDS

Walter Kunz, Oberwil, Switzerland; Wolfgang Eckhart, Lörrach, Fed. Rep. of Germany, and Adolf Hubele, Magden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

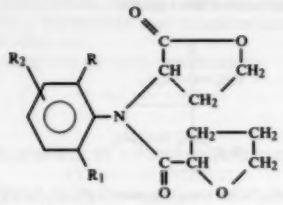
Continuation of Ser. No. 180,268, Aug. 22, 1980, abandoned, which is a continuation of Ser. No. 2,490, Jan. 11, 1979, abandoned, which is a division of Ser. No. 873,585, Jan. 30, 1978, Pat. No. 4,147,792. This application Mar. 2, 1982, Ser. No. 353,796

Claims priority, application Switzerland, Feb. 4, 1977, 1381; Mar. 28, 1977, 3884

Int. Cl.³ C07D *407/12*

U.S. Cl. 549—320 **5 Claims**

1. A compound of the formula



wherein each of R and R_1, independently of the other, is alkyl of 1 to 4 carbon atoms or halogeno, and R_2 is hydrogen, alkyl of 1 to 3 carbon atoms or halogeno.

4,443,619

CHLOROCITRIC ACIDS

Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, North Caldwell; Francis A. Mennona, Nutley, and Ann C. Sullivan, Cedar Grove, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

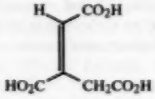
Division of Ser. No. 973,504, Dec. 26, 1978, Pat. No. 4,312,885. This application Aug. 7, 1981, Ser. No. 290,989

Int. Cl.³ C07D *301/02*

U.S. Cl. 549—518 **2 Claims**

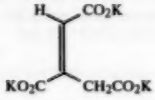
1. A process for the preparation of the mono-potassium dihydrogen salt of (±)-threo-epoxyaconitic acid which comprises the steps of

(a) contacting transaconitic acid of the formula



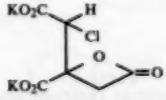
III

with a sufficient amount of potassium hydroxide in water to neutralize said acid and thus to form the tri-potassium metal salt of transaconitic acid of the formula



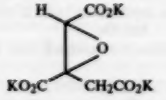
V

(b) contacting the reaction product of step (a) with an excess of chlorine gas so as to form a salt of (±)-threo-chlorocitric acid, β-lactone of the formula



VI

(c) reacting in situ the reaction product of step (b) with potassium hydroxide in an aqueous solvent at temperatures in the range of from about 0° C. to about 40° C. to form a potassium metal salt of (±)-threo-epoxyaconitic acid of the formula



XXXIII

(d) adjusting the pH to a value within the range of about 7.0 to about 7.5 and reacting the reaction product of step (c) with two molar equivalents of an acid to form the corresponding potassium metal dihydrogen salt of (±)-threo-epoxyaconitic acid.

4,443,620

PRODUCTION OF EPOXY COMPOUNDS FROM OLEFINIC COMPOUNDS

Abraham P. Gelbein, Plainfield, and Arthur S. Nislick, Wyckoff, both of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed May 3, 1979, Ser. No. 35,557

Int. Cl.³ C07D *301/26*

U.S. Cl. 549—521 **7 Claims**

1. A process for converting an olefinically unsaturated compound to the corresponding epoxy compound, comprising:

contacting a tertiary alkanol in an inert organic solvent, chlorine and calcium oxide in aqueous calcium chloride having a combined concentration of calcium oxide and calcium chloride equivalent to at least 25 weight percent expressed as calcium chloride to produce tertiary alkyl hypochlorite and aqueous calcium chloride; recovering tertiary alkyl hypochlorite in the inert organic solvent; contacting tertiary alkyl hypochlorite in the inert organic solvent, water and an olefinically unsaturated compound to produce the corresponding chlorohydrin and a tertiary alkanol; recovering tertiary alkanol and chlorohydrin in the inert organic solvent; contacting chlorohydrin and tertiary alkanol in the inert organic solvent and calcium oxide in an aqueous solution of calcium chloride having a combined concentration of calcium oxide and calcium chloride equivalent to at least 25 weight percent expressed as calcium chloride to convert the chlorohydrin to the corresponding epoxy compound and produce aqueous calcium chloride; recovering said epoxy compound; recovering tertiary alkanol in the inert organic solvent; passing tertiary alkanol in the inert organic solvent to the hypochlorite production; recovering from said hypochlorite production and said epoxy compound production an aqueous solution of calcium chloride having a calcium chloride concentration of at least 25 weight percent; and combining calcium oxide with a portion of said recovered aqueous solution of calcium chloride for providing said calcium oxide in aqueous calcium chloride for the producing of hypochlorite and epoxy compound.

4,443,621

P-NITROPHENYL 3-BROMO-2,2-DIETHOXY-PROPIONATE AND SYNTHETIC UTILITY THEREFOR

John L. LaMattina, Ledyard, and Paul D. Weeks, Gales Ferry, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 14, 1983, Ser. No. 474,958

Int. Cl.³ C07C *79/12*; **C07D** *309/40*

U.S. Cl. 560—142 **1 Claim**

1. p-Nitrophenyl 3-bromo-2,2-diethoxypropionate.

4,443,622

METHOD FOR MAKING CARBAMATES

Richard Smith, Opelika, Ala., assignor to West Point Pepperell, Inc., West Point, Ga.

Continuation of Ser. No. 263,880, May 15, 1981, abandoned, which is a continuation of Ser. No. 83,514, Oct. 10, 1979, abandoned. This application Sep. 24, 1982, Ser. No. 423,452

Int. Cl.³ C07C *125/04*

U.S. Cl. 560—166 **10 Claims**

1. In a method for the manufacture of carbamates in which an alcohol is reacted with urea and ammonia is liberated, the improvement wherein the reaction is carried out at a temperature of at least 130° C., under a vacuum of at least 20 inches of

mercury, said alcohol having a volatility no greater than that of diethylene glycol under the reaction conditions.

7. In a method for the manufacture of carbamates in which an alcohol is reacted with urea under a vacuum, the improvement wherein the reaction is carried out in the presence of magnesium oxide as a catalyst.

4,443,623

PREPARATION OF PREDOMINATELY METHYL ACRYLAMIDOGLYCOLATE METHYL ETHER IN A NORMALLY LIQUID PRODUCT

James M. Photis, Ridgefield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 12, 1982, Ser. No. 377,505

Int. Cl.³ C07C *102/00*

U.S. Cl. 560—170 **8 Claims**

1. A process for preparing methyl acrylamidoglycolate methyl ether in non-viscous liquid form comprising a major proportion of methyl acrylamidoglycolate methyl ether and a sufficient quantity of at least one of C_3 to C_6 alkyl acrylamido glycolate C_3 to C_6 alkyl ether, C_3 to C_6 alkyl acrylamidoglycolate methyl ether, and methyl acrylamidoglycolate C_3 to C_6 alkyl ether to provide a non-viscous liquid, which comprises reacting glyoxylic acid with a C_3 to C_6 alcohol under conditions which lead to azeotropic removal of water to provide C_3 to C_6 alkyl glyoxylate alkyl hemiacetal, reacting said C_3 to C_6 alkyl glyoxylate alkyl hemiacetal with an acrylamide while removing volatiles therefrom to provide C_3 to C_6 alkyl acrylamidoglycolate and reacting said C_3 to C_6 alkyl acrylamidoglycolate with methanol at elevated temperature in the presence of a transesterification/etherification catalyst while removing water and volatiles therefrom to provide said methyl acrylamidoglycolate methyl ether in non-viscous liquid form.

4,443,624

METHOD OF PREPARING MALONIC ACID DIALKYL ESTERS

Uwe Prange, Niederkassel-Ranzel; Moustafa El Chahawi, Troisdorf; Wilhelm Vogt, Köln-Sülz, and Hermann Richtzenbain, Much-Schwellenbach, all of Fed. Rep. of Germany, assignors to Dynamit Nobel AG, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 260,444, May 4, 1981, Pat. No. 4,399,300, which is a continuation of Ser. No. 169,009, Jul. 15, 1980, abandoned, which is a continuation of Ser. No. 879,993, Feb. 28, 1978, abandoned, which is a continuation of Ser. No. 687,841, May 19, 1976, abandoned. This application Apr. 5, 1982, Ser. No. 365,818

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1975, 2524389; Jan. 28, 1976, 2603026

Int. Cl.³ C07C *67/36*

U.S. Cl. 560—204 **21 Claims**

1. Process of producing a malonic acid dialkyl ester which comprises contacting the corresponding halogen acetic acid alkyl ester with carbon monoxide, and alkali metal alcholate, alkaline earth metal alcoholate or a solution of alkali metal hydroxide in an alcohol at a pH of up to 8.5 in the presence of a catalyst system based on a cobalt salt, Mn powder, and $Na_2S_2O_4$ as catalyst for the reaction, at a temperature of 0° to 150° C. and a carbon monoxide pressure of 0.1–50 atmospheres absolute.

4,443,625

PRODUCT FOR TREATING SOIL TO SUPPRESS THE NITRIFICATION OF AMMONIUM NITROGEN THEREIN

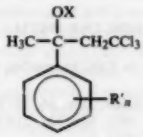
Jeffrey D. Griffith, Lafayette, Calif., and Thomas M. Ozretich, Vancouver, Wash., assignors to The Dow Chemical Co., Detroit, Mich.

Division of Ser. No. 59,086, Jul. 19, 1979, Pat. No. 4,317,672. This application May 14, 1981, Ser. No. 263,437

Int. Cl.³ C07C *33/46, 43/23, 69/07, 69/157, 69/24*

U.S. Cl. 560—254 **9 Claims**

1. A compound having the formula



wherein X is H or

R is H or C_1–C_8 alkyl;

R′ is C_1–C_4 alkyl, C_1–C_4 alkoxy or halo and n is an integer from 0 to 2.

4,443,626

2,3-DIHYDRO-INDENE DERIVATIVES

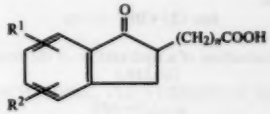
Kanji Noda, Tsukushino; Akira Nakagawa; Kenji Yamagata, both of Tosu; Yoichi Nakashima, Tacharai; Masayoshi Tsuji, Tosu; Tetsuo Aoki, Kiyama, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

Filed Jun. 7, 1982, Ser. No. 385,673

Int. Cl.³ C07C *79/46, 59/86*

U.S. Cl. 562—434 **20 Claims**

1. A 2,3-dihydro-indene derivative having anti-inflammatory effects and represented by the following general formula (I)



wherein R^1 and R^2 are each hydrogen, halogen, nitro, lower alkyl, with the proviso that at least one of R^1 and R^2 is other than hydrogen and n is an integer of 2–4.

4,443,627

PROCESS FOR THE PRODUCTION OF CARNITINE AMIDE

Leander Tenud, Visp, and René Blum, Binningen, both of, Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Jan. 20, 1982, Ser. No. 341,009

Claims priority, application Switzerland, Jan. 21, 1981, 363/81

Int. Cl.³ C07C *102/06, 103/183*

U.S. Cl. 564—136 **8 Claims**

1. Process for the production of carnitine amide in the form of a chloride, which comprises (i) reacting 4-chloroacetoacetic acid ethyl ester with trimethyl amine, (ii) hydrogenating the reaction product of step (i) with a Pt/C catalyst, carnitine ethyl ester resulting, (iii) reacting the carnitine ethyl ester, without isolating it, with ammonia in an autoclave at −30° to +10° C.,

(iv) heating the contents of the autoclave to 40° to 80° C., (v) stirring the mixture at such temperature at an ammoniac pressure of 8 to 24 atu, (vi) cooling the carnitine amide chloride to ambient temperature and counterbalancing the excess pressure, (vii) filtering the carnitine amide chloride, (viii) washing the carnitine amide chloride with ethyl alcohol, and (ix) drying the carnitine amide chloride at 30° to 50° C. and at a pressure of 15 to 25 torr.

4,443,628

ANTIDOTAL COMPOUNDS FOR USE WITH HERBICIDES

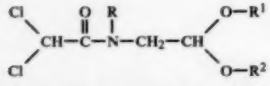
Jay K. Rinehart, Akron, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 106,433, Dec. 26, 1979, abandoned. This application Dec. 22, 1980, Ser. No. 218,874

Int. Cl.³ C07C *103/127*

U.S. Cl. 564—209 **2 Claims**

1. A compound of the formula:



wherein:

R is 2-propenyl, 2-butenyl or 2-methyl-2-propenyl, and R^1 and R^2 are alkyl of up to 4 carbon atoms.

4,443,629

PREPARATION OF HYDRAZIDINES

Gerhard Bonse, Cologne, and Thomas Schmidt, Haan, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

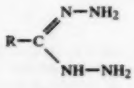
Filed Jun. 14, 1982, Ser. No. 387,907

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1981, 3126388

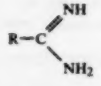
Int. Cl.³ C07C *123/02*

U.S. Cl. 564—226 **10 Claims**

1. In the production of a hydrazidine of the formula



in which R is an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group or an optionally substituted aralkyl group, or an acid addition salt thereof, by reacting the corresponding amidine of the formula



or an acid addition salt thereof with hydrazine, the improvement which comprises effecting the reaction with hydrazine hydrate in the presence of an organic solvent which may contain water under reduced pressure and at a temperature between about −80° and +100° C.

4,443,630

PROCESS FOR PREPARING 2-AMINO-5-NITROTOLUENE

Theodor Papenfuhs, Frankfurt am Main, and Rüdiger Berthold, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,510

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1982, 3200308

Int. Cl.³ C07C *85/04*

U.S. Cl. 564—406 **10 Claims**

8. A process for preparing 2-amino-5-nitrotoluene, comprising the step of heating to at least 180° C. the reaction mixture consisting essentially of 2-chloro-5-nitrotoluene and aqueous ammonia, said aqueous ammonia having a concentration of at least 30% by weight, and recovering the 2-amino-5-nitrotoluene product essentially without purification steps.

4,443,631

SELECTIVE HALOGENATION OF 2-FLUOROANILINE

Amphlett G. Padilla, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 105,064, Dec. 19, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,569

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—412 **4 Claims**

1. In a process comprising the bromination of 2-fluoroaniline, whereby high yields of 4-bromo-2-fluoroaniline are selectively obtained an improvement which comprises bromination in a solvent consisting essentially of dimethylformamide or dimethylacetamide.

4,443,632

MACROCYCLIC CARBONYL COMPOUNDS, PROCESS FOR THEIR PREPARATION AND THEIR USE AS STARTING MATERIALS FOR THE PREPARATION OF BICYCLIC UNSATURATED HYDROCARBONS

Karl H. Schulte-Elte, Onex; Bernard L. Muller, Geneva, and Eric Maillefer, Mont-sur-Rolle, all of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

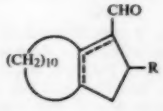
Filed Jun. 22, 1982, Ser. No. 390,808

Claims priority, application Switzerland, Jul. 17, 1981, 4708/81

Int. Cl.³ C07C *49/523, 45/61*

U.S. Cl. 568—375 **6 Claims**

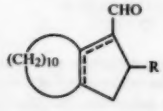
1. A compound of formula



(II)

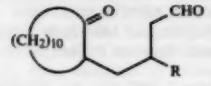
having a double bond in one of the positions indicated by the dotted lines and wherein symbol R designates a hydrogen atom or a methyl radical.

4. Process for the preparation of a compound of formula



(II)

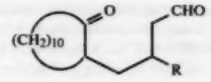
having a double bond in one of the positions indicated by the dotted lines and wherein R represents a hydrogen atom or a methyl radical, which comprises successively treating with a a secondary aliphatic or cycloaliphatic amine and a carboxylic acid a carbonyl compound of formula



(III)

wherein symbol R is defined above.

6. A compound of formula



(III)

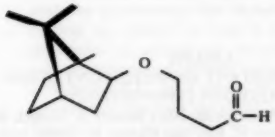
4,443,633

NORBORNYL OXYBUTYRALDEHYDE

Richard M. Boden, Ocean; William L. Schreiber, Jackson; Futoshi Fujioka, Wanamassa, all of N.J.; Patrick Chant, Brooklyn, N.Y., and Lambert Dekker, Wyckoff, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Apr. 6, 1982, Ser. No. 366,079
Int. Cl.³ C07C *47/115*
U.S. Cl. 568—445 **1 Claim**

1. The norbornyl oxybutyraldehyde having the structure:



4,443,634

REMOVAL OF IMPURITIES

William C. Ziegenhain, and Gary L. Horton, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Mar. 29, 1983, Ser. No. 480,178
Int. Cl.³ C07C *41/34*
U.S. Cl. 568—621 **7 Claims**

1. A process for the purification of liquid alcohol alkoxylate polymer feed streams containing one or more impurities present in a quantity of less than 2% by weight of the stream per impurity comprises:

(a) forcing the feed stream through a spray nozzle into an inert atmosphere at a temperature of from about 68° F. to about 392° F., where the pressure is at or below one atmosphere in such a manner to atomize the feed stream into particulate drops having a size in the range of from about 1,000 microns to about 50 microns in diameter,

(b) retaining the particulate drops under the conditions of (a), and within a temperature in the range of from about 68° F. to about 392° F. for at least 0.1 second to form impurity vapors,

(c) removing the impurity vapors that form during step (b), and

(d) collecting the purified, atomized feed stream liquid wherein the purified feed stream has a vapor pressure no higher than 1×10^{-3} mm of mercury at 68° F., and no higher than 50 mm of mercury at 392° F., and the vapor pressure limits of any impurity removed in step (c) require that its said vapor pressure be no lower than 5,000 mm of mercury at 392° F., and no lower than 10 mm of mercury at 68° F.

4,443,635

REMOVAL OF COLOR BODIES IN BISPHENOL PRODUCTION

William A. McLaughlin, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1982, Ser. No. 447,056
Int. Cl.³ C07C *39/16, 37/68*
U.S. Cl. 568—728 **9 Claims**

1. In a process for preparing bisphenols by reacting at least 2 moles of a phenol with a carbonyl compound in a reaction zone in the presence of an acidic catalyst to produce a product mixture containing phenol, bisphenol, and color bodies and wherein the product mixture is separated into a bisphenol/-phenol adduct and a mother liquor stream, wherein at least a portion of said mother liquor stream is contacted with an insoluble acidic cationic exchange resin for a period of time and at a temperature sufficient to reduce the content of color bodies contained in said mother liquor stream prior to recycling said mother liquor to said reaction zone, the improvement comprising periodically removing the adsorbed color bodies from said adsorbent by washing said adsorbent with an aqueous solution having a pH of at least about 8 and containing from about 10 to about 70% by weight of at least one phenate selected from the group consisting of phenates of alkali metals and of ammonia.

4,443,636

REFINING LURGI TAR ACIDS

Nicholas P. Greco, Edgewood, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jul. 14, 1982, Ser. No. 398,074
Int. Cl.³ C07C *37/74*
U.S. Cl. 568—761 **2 Claims**

1. A process for refining the tar acid fraction that is derived from the Lurgi gasification of coal comprising:

(a) treating the tar acid with an aqueous solution of sodium bisulfate; and

(b) distilling off the tar acids as distillate while the tar bases remain as salts in the residue and the neutral oils hydrolyze to products that also remain the residue.

4,443,637

THERMOCHEMICAL CONVERSION OF BIOMASS TO ETHANOL

Melville E. D. Hillman, Columbus, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jun. 17, 1982, Ser. No. 389,414
Int. Cl.³ C07C *29/00*
U.S. Cl. 568—876 **20 Claims**

1. In a process for converting a feedstock selected from the group consisting of a carbohydrate, lactic acid, and mixtures thereof, into product ethanol in the presence of a metal salt at a reaction temperature ranging from about 250° to about 400° C., the improvement which comprises:

establishing a reaction mixture of said feedstock, said metal salt, water, and an organic solvent which has a boiling point of at least about 150° C., can solvate said feedstock, and is stable at said reaction temperature, said solvent selected from the group consisting of an alcohol, an ether, a tertiary amine, an amine oxide, a sulfoxide, a quaternary ammonium hydroxide, and mixtures thereof, the proportion of solvent in said reaction mixture ranging from between about 10% and about 95% by weight of said water and said organic solvent, said process being conducted at atmospheric pressure.

4,443,638

PREPARATION OF ALCOHOLS FROM INTERNAL OLEFINS

James A. Yates, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Continuation of Ser. No. 250,977, Apr. 3, 1981, abandoned. This application Apr. 19, 1982, Ser. No. 369,953

Int. Cl.³ C07C *29/14*

U.S. Cl. 568—882 8 Claims

1. A process for preparing alcohols from internal C_4–C_{30} olefins wherein said process comprises:

(a) contacting said olefins with hydrogen and carbon monoxide in the presence of a ligand modified recycled rhodium catalyst where the rhodium is present in quantities less than 20 parts per million based on the total charge, and is greater than 0.1 parts per million based on total charge, at a temperature in the range of about 145° C. to about 180° C. and a pressure in the range of about 750 to about 2000 psig to form a reaction product containing a substantial amount of linear and 2-methyl branched aldehydes,

(b) separating the reaction product of step (a) from the rhodium catalyst by flash vacuum distillation,

(c) hydrogenating the distilled reaction product of step (b) using an effective amount of hydrogenation catalyst at a temperature in the range of about 100° to about 170° C. and a pressure in the range of about 200 to about 2000 psig to produce a crude alcohol mixture,

(d) fractionally distilling the crude alcohol mixture of step (c) to remove small amounts of light and heavy impurities and obtain a fraction containing a major amount of alcohols and minor amounts of carbonyl compounds,

(e) hydrogenating the fraction containing alcohols and carbonyls using the conditions of step (c) to convert the carbonyl compounds to alcohols and thereby obtaining an alcohol product containing one carbon atom more than the starting olefins, and

(f) recycling the product-catalyst bottoms from step (b) to step (a).

4,443,639

HYDROGENATION OF CARBOXYLIC ACIDS

Frederick A. Pesa, Aurora; Anne M. Graham, Northfield, and Wayne R. Kliewer, North Randall, all of Ohio, assignors to The Standard Oil Company (Indiana), Cleveland, Ohio

Division of Ser. No. 264,755, May 18, 1981, Pat. No. 4,398,039. This application Sep. 13, 1982, Ser. No. 416,807

Int. Cl.³ C07C *29/136*

U.S. Cl. 568—885 20 Claims

1. A process for the hydrogenation of carboxylic acids having from 1–10 carbon atoms, including contacting said carboxylic acids with hydrogen in the vapor phase at a reaction temperature of from about 150° C. to about 450° C. and a reaction pressure of about 250 psig to about 5,000 psig in the presence of water, in excess of the amount of water vapor formed in situ by the hydrogenation reaction, and a catalyst represented by the formula

$$A_aRu_bD_cE_dO_x$$

wherein

A=Zn, Cd and mixtures thereof;

D=Co, Ni and mixtures thereof;

E=Fe, Cu, Rh, Pd, Os, Ir, Pt and mixtures thereof;

and wherein

a=0 to 1.0,

b=0.01 to 3.0,

c=0.01 to 3.0,

d=0 to 1.0,

x=the number of oxygens determined by the valence requirements of the other elements present and is greater than zero.

4,443,640

PROCESS FOR THE PREPARATION OF AN AROMATIC HYDROCARBON MIXTURE

Johannes van der Meijden, and Auke F. de Vries, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 7, 1982, Ser. No. 375,850

Claims priority, application Netherlands, May 20, 1981, 8102470

Int. Cl.³ C07C *2/52, 12/46*

U.S. Cl. 585—418 10 Claims

1. In a process for the preparation of an aromatic hydrocarbon mixture, which comprises contacting at a temperature in the range from about 300°–650° C., a pressure of from 1–50 bar, and a space velocity of from 0.1–10 $g.g^{-1}.h^{-1}$ a feed comprising one or more non-aromatic organic compounds with a crystalline metal silicate which, after one hour's calcination in air at 500° C., has the following properties:

(a) thermally stable up to a temperature of at least 600° C.,

(b) an X-ray powder diffraction pattern in which the strongest lines are the four lines listed in Table 1 of this specification;

the improvement comprising that said product shall have enhanced benzene content when in the formula which represents the composition of the silicate, expressed in moles of the oxides, and which, in addition to SiO_2, comprises both Fe_2O_3, and Al_2O_3, the SiO_2/Fe_2O_3 molar ratio is in the range of 100–300, and the SiO_2/Al_2O_3 molar ratio is in the range of 135–1900.

4,443,641

ATTRITION RESISTANT BISMUTH-CONTAINING METAL/OXYGEN COMPOSITIONS

Samuel J. Tremont, Manchester, Mo.; Robert A. Keppel, Seabrook, Tex.; Emerson H. Lee, and George D. Davis, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 335,786, Dec. 30, 1981, Pat. No. 4,409,133. This application Apr. 25, 1983, Ser. No. 488,562

Int. Cl.³ C07C *2/72*

U.S. Cl. 585—428 21 Claims

1. A process for dehydrocoupling toluene which comprises:

(a) contacting the toluene in the vapor phase at a temperature from about 450° C. to about 650° C. with an attrition resistant bismuth-containing metal/oxygen composition comprising the infusion and reaction product of

(i) 35 to 80 mole percent of an alumina existing in a crystal form consisting of γ, δ, η, and χ crystal forms, and mixtures thereof, or that can be transformed by heat to such crystal forms, and characterized by

(a) a mean particle size from about 10 μm to about 200 μm, and

(b) a fractional porosity of at least 0.2,

(c) a surface area of at least 150 m^2/g, and

(d) a pore diameter such that at least 10 percent of the pores are less than 55 Å, and

(ii) 20 to 65 mole percent of at least one bismuth oxide, or compound convertible by heat to such bismuth oxide, having a maximum mean particle size of about 100 μm with the proviso that the alumina/bismuth oxide mean particle size ratio is at least 2, which metal oxide is susceptible of undergoing infusion and reaction with with the alumina upon being subjected to temperatures of at least 0.4 T_m for a time sufficient to cause infusion and reaction between the metal oxide and the alumina, wherein T_m is the melting point in °K. of the alumina which composition exhibits a surface area of less than 5 m^2/g, and

(b) recovering the toluene dehydrocoupled product.

4,443,642

ATTRITION RESISTANT METAL/OXYGEN COMPOSITIONS

Robert A. Keppel, Seabrook, Tex.; Samuel J. Tremont, Manchester, Mo.; Emerson H. Lee, and George D. Davis, both of Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 335,785, Dec. 30, 1981, Pat. No. 4,409,127. This application Apr. 23, 1983, Ser. No. 488,483
Int. Cl.³ C07C *2/72*
U.S. Cl. 585—428 27 Claims

1. A process for dehydrocoupling toluene which comprises:

(a) contacting the toluene in the vapor phase at a temperature from about 450° C. to about 650° C. with an attrition resistant metal/oxygen composition comprising the infusion and reaction product of

(i) 35 to 80 mole percent of an alumina existing in a crystal form selected from the group consisting of γ, δ, η, and χ crystal forms, and mixtures thereof, or that can be transformed by heat to such crystal forms, and characterized by

(a) a mean particle size from about 10 μm to about 200 μm,

(b) a fractional porosity of at least 0.2,

(c) a surface area of at least 150 m^2/g, and

(d) a pore diameter such that at least 10 percent of the pores are less than 55 Å, and

(ii) 20 to 65 mole percent of at least one metal oxide, or compound convertible by heat to such metal oxide, having a maximum mean particle size of about 100 μm with the proviso that the alumina/metal oxide mean particle size ratio is at least 2, which metal oxide is susceptible of undergoing infusion and reaction with with the alumina upon being subjected to temperatures of at least 0.4 T_m for a time sufficient to cause infusion and reaction between the metal oxide and the alumina, wherein T_m is the melting point in °K. of the alumina wherein the composition is represented by the empirical formula selected from the group consisting of $Pb_{10}Sb_3Bi_2O_x(Al_2O_3)_{7\text{-}28}$, $Bi_{15\text{-}30}K_{4.5}Zr_{1\text{-}2}O_x(Al_2O_3)_{16\text{-}29}$, $(PbO_x)_3(Al_2O_3)4$, $Pb_5BiO_x(Al_2O_3)18$, $Pb_{10}Sb_3Bi_2KO_x(Al_2O_3)19$, $Bi_{15}Ca_5ZrO_x(Al_2O_3)16$, $Bi_5Fe_5Ca_5BO_x(Al_2O_3)8$, and $Bi_2Fe_2Ca_2O_x(Al_2O_3)3$.

4,443,643

REACTION OF BENZENE WITH ETHYLENE OXIDE TO PRODUCE STYRENE

James M. Watson, and Cleve Forward, both of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed May 23, 1983, Ser. No. 497,378
Int. Cl.³ C07C *1/20*
U.S. Cl. 585—437 1 Claim

1. A one step process for producing styrene comprising reacting ethylene oxide with benzene under conversion conditions in the presence of an an aluminosilicate, large pore, Type Y molecular sieve zeolite catalyst, wherein the conversion conditions comprise:

(a) a reactor inlet temperature from about 600° F. to about 825° F.;

(b) a reactor inlet pressure from about 50 psig to about 100 psig

(c) a liquid hourly space velocity from about 1 to about 15; and

(d) a molar ratio of benzene to ethylene oxide from about 1:1 to about 10:1.

4,443,644

METHANE CONVERSION

C. Andrew Jones, Newton Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,665, Aug. 20, 1982. This application Aug. 12, 1983, Ser. No. 522,876
Int. Cl.³ C07C *2/00*
U.S. Cl. 585—500 22 Claims

1. A method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane and a reducible oxide of antimony at a temperature within the range of about 500° to 1000° C.

14. A method for synthesizing hydrocarbons from a methane source which comprises:

(a) contacting a gas comprising methane with a solid comprising a reducible oxide of antimony at a temperature within the range of about 500° to 1000° C. to form C_2+ hydrocarbons, coproduct water, and solids comprising a reduced oxide of antimony, said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and compounds thereof

(b) recovering C_2+ hydrocarbons;

(c) at least periodically contacting the solids comprising a reduced oxide of antimony with an oxygen-containing gas to produce a solid comprising a reducible oxide of antimony; and

(d) contacting a gas comprising methane with the solids produced in step (c) as recited in step (a).

4,443,645

METHANE CONVERSION

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,663, Aug. 30, 1982. This application Aug. 12, 1983, Ser. No. 522,905
Int. Cl.³ C07C *2/00*
U.S. Cl. 585—500 22 Claims

1. A method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane and a reducible oxide of germanium at a temperature within the range of about 500° to 800° C.

14. A method for synthesizing hydrocarbons from a methane source which comprises:

(a) contacting a gas comprising methane with a solid comprising a reducible oxide of germanium at a temperature within the range of about 500° C. to 800° C. to form C_2+ hydrocarbons, coproduct water, and solids comprising a reduced oxide of germanium;

(b) recovering C_2+ hydrocarbons;

(c) at least periodically contacting the solids comprising a reduced oxide of germanium with an oxygen containing gas to produce a solid comprising a reducible oxide of germanium; and

(d) contacting a gas comprising methane with the solids product in step (c) as recited in step (a).

4,443,646

METHANE CONVERSION

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,666, Aug. 30, 1982. This application Aug. 12, 1983, Ser. No. 522,906
Int. Cl.³ C07C *2/00*
U.S. Cl. 585—500 22 Claims

1. A method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane and a reducible oxide of bismuth at a temperature within the range of about 500° to 850° C.

14. A method for synthesizing hydrocarbons from a methane source which comprises:

(a) contacting a gas comprising methane with a solid comprising a reducible oxide of bismuth at a temperature within the range of about 500° to 850° C. to form C_2+ hydrocarbons, coproduct water, and solids comprising a reduced oxide of bismuth, said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and compounds thereof.

(b) recovering C_2+ hydrocarbons,

(c) at least periodically contacting the solids comprising a reduced oxide of bismuth with an oxygen containing gas to produce a solid comprising a reducible oxide of bismuth; and

(d) contacting a gas comprising methane with the solids produced in step (c) as recited in step (a).

4,443,647

METHANE CONVERSION

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,664, Aug. 30, 1982. This application Aug. 12, 1983, Ser. No. 522,877

Int. Cl.³ C07C *2/00*

U.S. Cl. 585—500 **22 Claims**

1. A method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane and a reducible oxide of lead at a temperature within the range of about 500° to 1000° C.

14. A method for synthesizing hydrocarbons from a methane source which comprises:

(a) contacting a gas comprising methane with a solid comprising a reducible oxide of lead at a temperature within the range of about 500° to 1000° C. to form C_2+ hydrocarbons, coproduct water, and solids comprising a reduced oxide of lead; said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt and Au and compounds thereof.

(b) recovering C_2+ hydrocarbons;

(c) at least periodically contacting the solids comprising a reduced oxide of lead with an oxygen-containing gas to produce a solid comprising a reducible oxide of lead; and

(d) contacting a gas comprising methane with the solids produced in step (c) as recited in step (a).

4,443,648

METHANE CONVERSION

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,662, Aug. 30, 1982. This application Aug. 12, 1983, Ser. No. 522,942

Int. Cl.³ C07C *2/00*

U.S. Cl. 585—500 **22 Claims**

1. A method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane and a reducible oxide of indium at a temperature within the range of about 500° to 850° C., said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, As, Os, Ir, Pt, Au and compounds thereof.

14. A method for synthesizing hydrocarbons from a methane source which comprises:

(a) contacting a gas comprising methane with a solid comprising a reducible oxide of indium at a temperature within the range of about 500° to 850° C. to form C_2+ hydrocarbons, coproduct water, and solids comprising a reduced oxide of indium;

(b) recovering C_2+ hydrocarbons;

(c) at least periodically contacting the solids comprising a reduced oxide of indium with an oxygen containing gas to produce a solid comprising a reducible oxide of indium; and

(d) contacting a gas comprising methane with the solids produced in step (c) as recited in step (a).

4,443,649

METHANE CONVERSION

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, West Chester, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 412,667, Aug. 30, 1982. This application Aug. 12, 1983, Ser. No. 522,925

Int. Cl.³ C07C *2/00*

U.S. Cl. 585—500 **23 Claims**

1. A method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane and a reducible oxide of manganese at a temperature within the range of about 500° to 1000° C., said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and compounds thereof.

14. A method for synthesizing hydrocarbons from a methane source which comprises:

(a) contacting a gas comprising methane with a solid comprising a reducible oxide of manganese at a temperature within the range of about 500° to 1000° C. to form C_2+ hydrocarbons, coproduct water, and solids comprising a reduced oxide of manganese, said contacting being carried out in the substantial absence of catalytically effective Ni, Rh, Pd, Ag, Os, Ir, Pt, Au and compounds thereof;

(b) recovering C_2+ hydrocarbons;

(c) at least periodically contacting the solids comprising the reduced oxide of manganese with oxygen containing gas to produce a solid comprising a reducible oxide of manganese; and

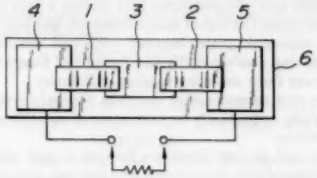
(d) contacting a gas comprising methane with the solids produced in step (c) as recited in step (a).

4,443,650

THERMOELECTRIC CONVERTER ELEMENT

Toshinori Takagi, Nagaokakyo, and Kakuei Matsubara, Hirakata, both of Japan, assignors to Kyoto University, Kyoto, Japan

Filed Apr. 16, 1982, Ser. No. 369,116
Claims priority, application Japan, Apr. 17, 1981, 56-56993
Int. Cl.³ H01L *35/28*
U.S. Cl. 136—211 20 Claims



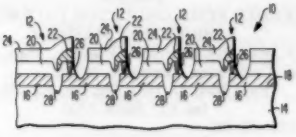
1. A thermoelectric converter element, comprising at least one film made of a semiconductor produced by a film forming technique based on ions and capable of thermoelectric conversion, said semiconductor having a crystal structure such that a crystallographic axis thereof is substantially aligned with a preferred orientation which is substantially perpendicular to the direction of flow of an electric current produced by the thermoelectric conversion therein.

4,443,651

SERIES CONNECTED SOLAR CELLS ON A SINGLE SUBSTRATE

George A. Swartz, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 249,729, Mar. 31, 1981, abandoned.
This application Dec. 16, 1982, Ser. No. 450,223
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—249 9 Claims



1. A solar cell array comprising a plurality of adjacent, series connected solar cells on a single insulating substrate comprising

(a) a plurality of spaced lower electrodes on a surface of the substrate;

(b) a semiconductor layer comprising amorphous silicon over said lower electrodes and the surface of the substrate between the first electrodes;

(c) a plurality of spaced upper electrodes on the upper surface of said semiconductor layer with each upper electrode overlying one of the lower electrodes to form a solar cell, and

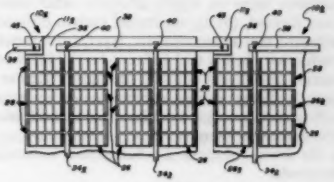
(d) interelectrode connection means electrically connecting the upper electrode of one solar cell to the lower electrode of the next adjacent solar cell comprising a metal stripe contacting the upper electrode and including a portion spiked completely through the semiconductor layer and contacting the lower electrode of the adjacent cell.

4,443,652

ELECTRICALLY INTERCONNECTED LARGE AREA PHOTOVOLTAIC CELLS AND METHOD OF PRODUCING SAID CELLS

Masatsugu Izu, Southfield; Prem Nath, Rochester, and Arthur Holland, Washington, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 9, 1982, Ser. No. 440,385
Int. Cl.³ H01L *31/04, 31/18*
U.S. Cl. 136—251 48 Claims



1. In a large area photovoltaic cell which comprises a plurality of electrically isolated small area segments sharing a common electrically-conductive substrate upon which a plurality of continuous semiconductor layers are deposited, each small area segment defined by a discrete portion of a transparent conductive coating atop the semiconductor layers, whereby each small area segment is electrically isolated from other small area segments; and a plurality of spaced, electrically-conductive busbars disposed atop and electrically connected to the plurality of small area segments; the improvement comprising, in combination;

each of the busbars terminating on the same portion of the surface of the large area cell;

an electrically insulating layer between the busbars and the surface therebeneath to prevent short circuiting;

an electrically-insulating layer between the busbars and the busbar terminating portion of the large area cell to prevent short circuiting;

first connecting means for electrically interconnecting each of the plurality of spaced busbars; and

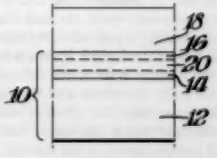
at least one means for providing electrical access to the common substrate from the layered surface of the large area cell, whereby the first connecting means provides a first electrode of the large area photovoltaic cell and the access means provides a second electrode of the large area photovoltaic cell.

4,443,653

THIN FILM PHOTOVOLTAIC DEVICE WITH MULTILAYER SUBSTRATE

Anthony W. Catalano, Rushland, Pa., and Manjul Bhushan, Wilmington, Del., assignors to The University of Delaware, Newark, Del.

Continuation-in-part of Ser. No. 200,447, Oct. 24, 1980, Pat. No. 4,342,879. This application Feb. 23, 1982, Ser. No. 351,472
The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.
Int. Cl.³ H01L *31/06, 31/18*
U.S. Cl. 136—265 26 Claims



1. In a thin film photovoltaic device having an ohmic back

contact and a transparent electrical contact with at least one semiconductor layer therebetween of a material of the type formed by high temperature growth, the improvement being said ohmic back contact comprises a multilayer substrate capable of withstanding the high temperature for forming said semiconductor layer, said semiconductor layer which is adjacent said substrate being made of a material from the class of isostructural compounds comprised of elements selected from Groups IIB and VA of the Periodic Table, said substrate layers including (a) a lowermost support layer remote from said semiconductor layer on which all of the other layers of said device are formed, (b) an uppermost carbon diffusion barrier layer adjacent said semiconductor layer, (c) a metal layer of high conductivity below said diffusion barrier layer and having an expansion coefficient equal to or slightly greater than the expansion coefficient of said semiconductor layer, and (d) an intermediate metal carbide layer between said diffusion barrier layer and said metal layer.

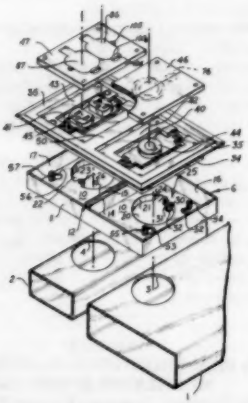
4. In the device of claim 1 wherein said semiconductor is zinc phosphide.

4,443,654

FLUSH FLOOR FITTING

Charles T. Flachbarth, Parkersburg; Richard D. Benscoter, Vienna, and James E. Sheridan, Williamstown, all of W. Va., assignors to Butler Manufacturing Company, Kansas City, Mo.

Filed Oct. 19, 1981, Ser. No. 312,649
Int. Cl.³ H02G 3/14
U.S. Cl. 174—48 **7 Claims**



1. In a floor having an electrical distribution system underneath the surface of the floor, the system including substantially flat mechanism formed with a pair of adjacent access holes respectively providing access to the electrical distribution system, a floor service fitting comprising:

an attaching ring including a bottom wall engaging and supported on said flat mechanism, side walls disposed on the periphery of the bottom wall and extending upwardly therefrom and an intermediate wall extending between a pair of opposite side walls, the side walls and the intermediate wall forming a pair of compartments;

in each said compartment, an aperture formed by a circular wall on the bottom wall of the compartment and extending downwardly therefrom and through an access hole in said mechanism and the circular wall having an open section disposed below the top of said mechanism;

in each said compartment, a tab formed on the bottom wall of the compartment in a position adjacent to the open section of the circular wall, the tab extending into the aperture;

a pair of screws respectively rotatably mounted on said tabs;

a pair of locking clamps respectively threaded on said screws and respectively extending through the open sections of said circular walls and engaging the underside of said mechanism and locking the attaching ring to the mechanism;

in each compartment, a pair of key-hole slots formed in the bottom wall of the compartment;

in each key-hole slot, an adjusting screw having a threaded body extending upwardly away from the slot respectively into said compartments and having a thin head disposed between the top of said mechanism and said bottom wall;

an adjustable plate disposed over said attaching ring and having a substantially flat, peripheral flange for extending over floor covering used on said floor;

first and second outlet openings formed in said adjustable plate respectively in communication with said compartments;

first and second shoulders formed in said adjustable plate respectively surrounding said first and second outlet openings;

a first pair of adjusting cavity sections formed on said first shoulder and extending downwardly therefrom into one of said compartments, the lower ends of the cavity section being threaded and respectively receiving a pair of said adjusting screws;

a second pair of adjusting cavity sections formed on said second shoulder and extending downwardly therefrom into the other of said compartments, the lower ends of the second cavity sections being threaded and respectively receiving the other pair of said adjusting screws;

said adjusting cavities each providing an opening for a tool to be inserted therein to engage the adjusting screw in the cavity and turn the adjusting screw, the turning of the adjusting screws raising or lowering said adjusting plate for positioning said flange with respect to the surface of the floor;

at least one receptacle means mounted on one of said shoulders and extending through the outlet opening thereof; and

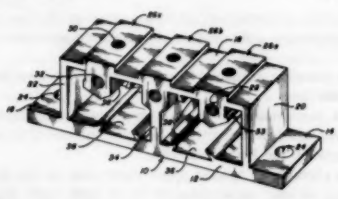
a pair of substantially flat access plates respectively mounted on said first and second shoulders and covering the shoulders and extending over the first and second outlet openings and over said one receptacle means.

4,443,655

EXTRUDED SEMICONDUCTOR PACKAGE AND FABRICATION METHOD

Herman F. Van Dyk Soerewyn, Peabody, Mass., assignor to Unitrode Corporation, Lexington, Mass.

Filed Nov. 27, 1981, Ser. No. 325,279
Int. Cl.³ H05K 5/00
U.S. Cl. 174—52 PE **15 Claims**



13. For use in fabricating a high power semiconductor package, a conductive housing comprising:

a unitary extruded electrically conductive member having a bottom plate, a top wall, and first and second side walls defining an interior;

at least two terminal studs each having an upper portion integral with the top wall, and a lower portion within the interior in spaced relation to the bottom plate;

the top wall having intermediate sections adjacent each terminal stud integrally joining the terminal studs and member;

a plurality of retaining elements integral with the top wall, each adjacent a respective terminal stud; and

a plurality of retaining elements integral with the bottom plate, each in alignment with a respective element in the top wall;

the intermediate sections of the top wall being operative to retain the terminal studs in position during component assembly and encapsulation, and which are removable after encapsulation to electrically separate the terminal studs from each other.

4,443,656

ELECTRICAL COMPONENT MEMBER WHICH IS MOUNTED IN A HOUSING CENTERED AND ADJUSTED

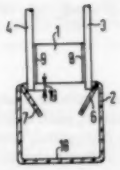
Heinrich Linse, Lappersdorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,657

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112906

Int. Cl.³ H05K *7/12*

U.S. Cl. 174—52 PE **5 Claims**



1. Electrical component comprising an electrical component member mounted centered and adjusted in a cup-shaped housing having a rectangular cross section, the housing having an opening through which lead wires from the electrical component member protrude in the same direction, and hardened sealing compound securing the electrical component member in the cup-shaped housing, the cup-shaped housing of rectangular cross section having, at least on two opposite sides thereof, integrally formed tabs consisting of the same material as that of the cup-shaped housing, said tabs being bent into the interior of the cup-shaped housing and resiliently clamping the electrical component member in said housing, said tabs being encased in the hardened sealing compound and serving as centering and adjusting means for said electrical component member.

4,443,657

RIBBON CABLE WITH A TWO-LAYER INSULATION

Ronald A. Hill, Harthausen; Ralf Tillmanns, Schoenau, and Bernd Sieberling, Gruenwold, all of Fed. Rep. of Germany, assignors to W. L. Gore & Associates, Inc., Newark, Del.

Continuation-in-part of Ser. No. 266,721, May 26, 1981, abandoned. This application Sep. 21, 1982, Ser. No. 420,876

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020622

Int. Cl.³ H01B *7/08*

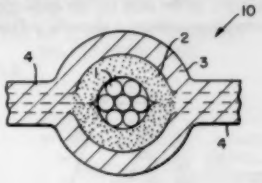
U.S. Cl. 174—110 FC **12 Claims**

1. A multiconductor ribbon cable for transmitting electromagnetic signals comprising:

a plurality of conductors spaced apart in a planar relationship;

a plurality of inner layers each surrounding one of said conductors, said inner layers being formed of porous, substantially unsintered polytetrafluoroethylene;

a plurality of outer layers each substantially surrounding one of said inner layers, said outer layer being formed of impermeable sintered polytetrafluoroethylene; and



a plurality of webs each connecting an outer layer to an adjacent outer layer, each of said webs being formed of impermeable sintered polytetrafluoroethylene.

4,443,658

REMOTE CONTROL CABLE FOR TRANSMITTING ELECTRICAL SIGNALS AND PROCESS AND APPARATUS FOR PRODUCTION THEREOF

Pierre Seguin, Chavanoz, France

Filed Jul. 12, 1982, Ser. No. 397,245

Int. Cl.³ H01B *7/04*

U.S. Cl. 174—113 C **14 Claims**

1. A remote control cable suitable for controlling bodies moving at high speed comprising, in combination:

(a) a central element consisting of a textile element;

(b) two conducting wires in contact with the central element over their entire length and separated by the central element to maintain the conductors spaced apart a predetermined distance parallel to one another, the diameter of the central element being slightly greater than the predetermined distance between the wires;

(c) a thermofusible material coating the textile element and the two conducting wires;

(d) a bundle of reinforcing filaments surrounding the central element and conducting wires and extending parallel thereto; and

(e) at least one layer of braiding covering the central element, the conducting wires, the coating and the reinforcing filaments.

4,443,659

GLAZE TO PIN CONNECTION FOR AN ELECTRICAL INSULATOR WITH EMBEDDED METAL FITTING

William A. Tatem, Avon, N.Y., assignor to Interpace Corporation, Parsippany, N.J.

Continuation-in-part of Ser. No. 234,881, Feb. 17, 1981, abandoned. This application Aug. 2, 1982, Ser. No. 404,620

Int. Cl.³ H01B *17/42, 17/50, 17/08*

U.S. Cl. 174—140 C **5 Claims**

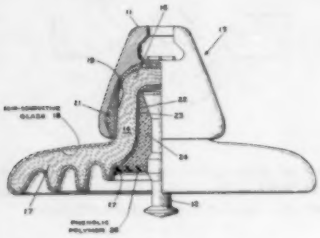
1. In an electrical insulator comprising in combination:

a suitably contoured porcelain shell with a semiconductive glaze;

a metal cap and a metal pin each situated at a surface of the insulator shell opposite to the other, the insulator shell forming a pin recess receiving the pin;

capping means securing mechanically the cap to the shell; and

Portland cement in the recess and about the pin securing mechanically to the shell the pin embedded in the recess; the improvement comprising a phenolic polymer composition



having long term weather resistance and being connected between the pin and the glaze and substantially sealing the Portland cement from contact with moisture in the air, the phenolic polymer composition having a nonionic electrical conductivity substantially greater than the conductivity of the Portland cement.

4,443,660

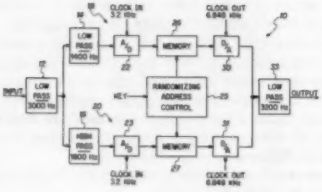
SYSTEM AND METHOD FOR ENCRYPTING A VOICE SIGNAL

Vincent R. DeLong, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 118,360, Feb. 4, 1980. This application Feb. 10, 1982, Ser. No. 347,598

Int. Cl.³ H04K *1/06*

U.S. Cl. 178—22.04 **18 Claims**



16. A system for encrypting an analog input signal, comprising:

means for filtering said input signal to provide a signal in a first path, having frequency components in a higher frequency band, and a signal in a second path having frequency components in a lower frequency band;

means for deriving digital samples from the signal in the first path at a first rate and from the signal in the second path at the same rate, and for inverting the frequency composition in said first path so that frequency components which were at higher frequencies before inversion are at lower frequencies after inversion and components which were at lower frequencies are at higher frequencies, and for shifting the higher band frequency components in said first path to lie in said lower band; and

means for intermixing segments of the samples from said first and second paths and converting to analog form at a rate greater than twice said first rate to provide a sequence of rearranged, randomized time segments of signals from said first and second paths, including means for interspersing said segments with gaps.

4,443,661

METHOD OF DETECTING TROUBLES IN A RECEIVER FOR A COMMON CONTROL CHANNEL OF A MOBILE RADIO TELEPHONE COMMUNICATION SYSTEM AND A SYSTEM THEREFOR

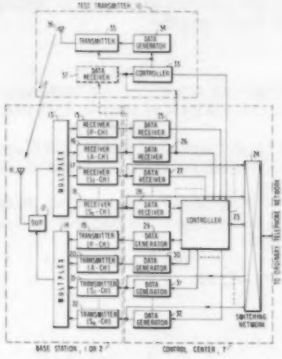
Hiroshi Kubo, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,406

Claims priority, application Japan, Oct. 31, 1980, 55-153436

Int. Cl.³ H04Q *7/04;* **H04B** *17/00*

U.S. Cl. 179—2 EB **8 Claims**



1. In a mobile radio telephone system of the type having mobile stations; base stations, each base station having a plurality of speech channel transmitter/receivers to transmit and receive signals through a speech channel and an access channel transmitter/receiver to control calls from said mobile stations through an access channel; and a central station for connecting said mobile stations and a telephone exchange network or said mobile station with each other by way of said base stations, the improvement comprising:

means for detecting from the output of said access channel receiver a calling signal from said mobile station and a test calling signal and providing a detection output in response to said calling signal and said test calling signal; and

control means connected to the output of said detecting means for transmitting said test calling signal to the last-mentioned access channel receiver if the detection output of said detecting means is not received within a first predetermined interval of time and, for generating a trouble signal if said detection output is not received within a second predetermined interval of time, after the transmission of said test calling signal, said second predetermined interval of time being shorter than said first predetermined interval of time.

4,443,662

FILTERS COMPRISING REACTIVE COMPONENTS, AND A METHOD OF DETERMINING IMPEDANCES THEREOF

Michael S. Nakhla, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

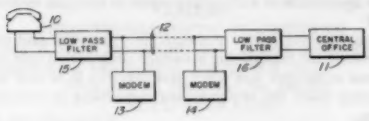
Continuation-in-part of Ser. No. 252,925, Apr. 10, 1981, abandoned. This application Dec. 23, 1981, Ser. No. 333,665

Int. Cl.³ H04M *11/00;* **H03H** *5/00*

U.S. Cl. 179—2 C **9 Claims**

7. In combination, a low pass filter having an input port and an output port, telephone equipment of nominal impedance **Z1** coupled to the input port of the filter, and a telephone subscriber line of nominal impedance **Z2** coupled to the output port of the filter, wherein the filter comprises reactive components which define a pass band for voice frequency signals and a stop band for higher frequencies, and wherein the imped-

ances of said reactive components are selected to minimize the sum $|Zin-Z2|+|Zout-Z1|$ in said pass band, where Zin and Zout are respectively the input and output impedances of the



filter, whereby the attenuation of the filter throughout said pass band is substantially constant regardless of the actual impedance of the telephone subscriber line.

4,443,663

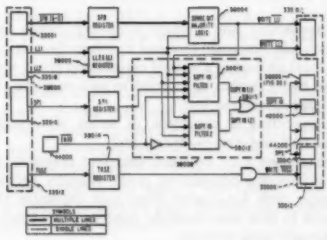
FILTERING OF PORT DATA IN A SWITCHING SYSTEM EMPLOYING INTERACTIVE PROCESSORS

Thomas E. Ellis, Altamonte Springs; Pedro A. Lenk, Fern Park, and Jayantkumar R. Shah, Longwood, all of Fla., assignors to Stromberg-Carlson Corporation, Lake Mary, Fla.

Continuation of Ser. No. 231,181, Feb. 3, 1981, abandoned, which is a continuation of Ser. No. 72,492, Sep. 4, 1979, abandoned, which is a continuation of Ser. No. 924,881, Jul. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 864,401, Dec. 27, 1977, abandoned. This application Apr. 29, 1982, Ser. No. 373,315

Int. Cl.³ H04Q *3/54*

U.S. Cl. 179—18 ES **14 Claims**



8. A control system for a telephone switching system that includes a plurality of ports each of which receives and transmits voice signals and supervisory signals on a telephone line, said control system comprising:

A. storage means for storing supervisory information in the form of a plurality of signals representing successive time samples of the supervisory signals;

B. signal transfer means for transferring supervisory signals between the ports and said storage means; and

C. port event processing means connected to said storage means for controlling the operation of each said port in response to the information stored in said storage means, said port event processing means including:

i. timing means for retrieving, in a predetermined sequence, stored supervisory information for each port from said storage means;

ii. filter means connected to said storage means and said timing means for generating a filtered supervisory signal in response to the stored supervisory information, including logic means for receiving a group of successive time sample signals in parallel thereby to produce a filtered supervisory signal that reflects the state of the majority of the received sample signals;

iii. control means connected to said timing means and said filter means for using the filtered supervisory signal to control the operation of the port, and

iv. means connected to said filter means for transferring updated supervisory information to said storage means.

4,443,664

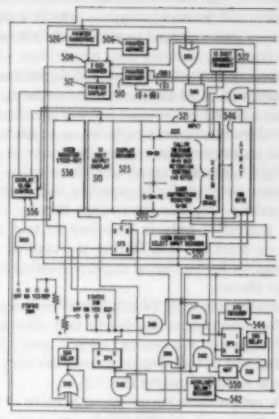
TELEPHONE STATION INCORPORATING EXCHANGE MESSAGE SYSTEM

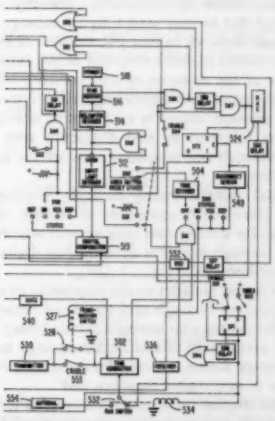
Robert A. Gange, Belle Mead, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,821

Int. Cl.³ H04M *15/06*

U.S. Cl. 179—5.5 **11 Claims**





1. A telephone station adapted to be connected to a telephone network, said station comprising:

manually-activated switch means including a dial;

a cradle switch;

digital storage means including a plurality of registers;

means for selectively allotting an individual one of said registers;

a pointer display coupled to said selectively-allotting means for indicating said allotted one of said digital registers;

an output display coupled to said digital storage means for indicating the digital value stored in said allotted one of said digital registers; and

logic means coupled to said manually-activated switch means, said cradle switch, said digital storage means, and said selectively-allotting means for:

(1) operating said selectively-allotting means under the con-

trol of said manually-activated switch means to selectively-allot any single one of said digital registers;

(2) placing said telephone station in an unattended status mode in accordance with an operation of said manually-activated switch means so that said station can answer incoming calls received from said telephone network with said cradle switch on-hook;

(3) operating said selectively-allotting means when said station is in said unattended status mode in response to an incoming call to said station in which a digital message from a caller is received to selectively-allot a digital register to that call; and

(4) forwarding each of said received digital messsages when said station is in an unattended status mode to the digital register allotted to that call for storage therein; wherein:

said digital storage means includes an auxiliary register;

said logic means includes means responsive to the receipt of any digital message received from a caller through said telephone network for forwarding said digital message to said auxiliary register for storage therein, and means enabled thereafter only in response to said cradle switch being on-hook for transferring the content of said auxiliary register to the digital register allotted to that call for storage therein;

said manually-activated switch means includes a switch for coupling said output display to said allotted one of said digital registers in a normal switch position thereof and coupling said output display to said auxiliary register in an operated switch position thereof;

said logic means includes means responsive to the receipt of an incoming call when said station is in an unattended status mode for transmitting to said caller through said telephone network a distinctive tone indicative of the fact that said station is unattended, whereby said caller is informed that he may send a digital message through said telephone network to said unattended telephone station;

said logic means includes steer-out means responsive to the transfer of the contents of said auxiliary register to said allotted one of said digital registers for transmitting the digital message stored in said allotted one of said digital registers followed by said distinctive tone back to the caller through said telephone network for verification by the caller;

said digital storage means includes verification storage means individually associated with each of said digital registers for storing a bit indicative of whether or not the digital message stored in an individual digital register has been verified;

said logic means includes means responsive to an affirmative code received through said telephone network from the caller for storing a bit having a certain binary value indicative of verification of said digital message in the verification storage means individually associated with the allotted one of said digital registers; and

said output display includes means coupled to said verification means, and responsive to said stored bit associated with that one of said digital registers in which the digital message then being displayed is stored having said certain binary value for displaying that digital message with a particular attribute which distinguishes the output display thereof from that of a non-verified digital message.

4,443,665

PRIVACY AND HOLD CIRCUIT FOR TELEPHONE

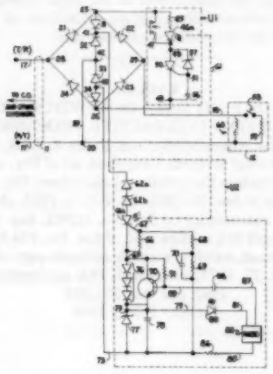
Robert J. Alderman, 3406 G-7 Ranch Rd., Ruskin, Fla. 33570

Filed Sep. 30, 1982, Ser. No. 430,946
Int. Cl.³ H04M *1/70*
U.S. Cl. 179—99 H **5 Claims**

1. In a telephone hold circuit of the type including a thyristor, said thyristor including a first main terminal and a second main terminal connected to shunt a telephone subscriber line with said first main terminal connected to a negative lead of said telephone subscriber line and a gate terminal and a characteristic gate to first main terminal junction;

said circuit including means for selectively triggering said thyristor from an off state to a conducting state by selective application of a triggering signal to said gate terminal; and

voltage dropping means connected in series with said main terminals for maintaining a voltage drop across said telephone subscriber line when said thyristor is in said conducting state; the improvement comprising in combination;



means connecting said voltage dropping means in series between said first main terminal at a first connection point and a local ground at a second connection point, said local ground being further connected to said negative conductor of said telephone line;

means connecting a capacitor in series with said local ground and said gate terminal; and

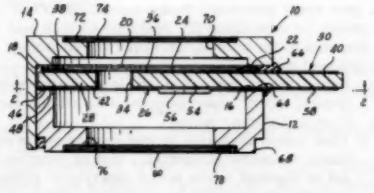
load means connected between said first connecting point and said second connecting point, thereby providing a discharge path for charge from said capacitor through said gate to first main terminal junction, said load means, back to said local ground.

4,443,666

ELECTRET MICROPHONE ASSEMBLY

Paul L. Cote, Windham, N.H., assignor to Gentex Corporation, Carbondale, Pa.

Filed Nov. 24, 1980, Ser. No. 209,519
Int. Cl.³ H04R *19/01, 19/04*
U.S. Cl. 179—111 E **8 Claims**



4. A microphone including in combination a housing having apertured rear and front portions and an opening formed therein intermediate said portions, an insulating support having a back and a front respectively adjacent said rear and front portions, said support having an enclosed portion contained in said housing and an exposed portion extending out of said housing through said opening, an electret transducer element carried on the front of said enclosed portion, means forming an

electrical contact on the exposed portion of said support, and means coupling said transducer element to said electrical contact.

4,443,667

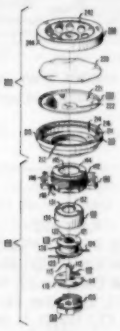
ELECTROMAGNETIC TRANSDUCER

Richard M. Hunt, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 11, 1982, Ser. No. 338,231

Int. Cl.³ H04R *11/00*

U.S. Cl. 179—115 R **20 Claims**



1. An electromagnetic transducer comprising a pole piece (112) including a face (113) at one end, a coil (126) disposed about the pole piece, and a central armature (222) overlying and spaced from the face of the pole piece to provide a first air gap characterized in that a cup-shaped permanent magnet (130) is disposed about the pole piece, the cup-shaped magnet having a wall portion (134) and a base portion (131) and being inverted with respect to the face end of the pole piece, the base portion having a central opening (132) that is larger than the face of the pole piece, the rim of the opening being one pole of the permanent magnet and being spaced from the central armature to provide a second air gap, the first and second air gaps being approximately equivalent.

4,443,668

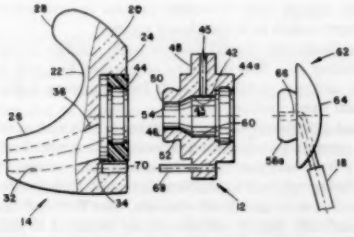
EARPLUG MOUNTING DEVICE WITH AUDIO PASSAGEWAY

James C. Warren, 3808 S. Jasmine St., Denver, Colo. 80237

Filed Mar. 23, 1981, Ser. No. 246,445

Int. Cl.³ H01M *1/05*

U.S. Cl. 179—156 A **12 Claims**



1. An earplug mounting device for insertion into the human ear, said mounting device adapted to support audio aids and provide sound communication between a radio receiver and the human ear, wherein the human ear includes an outer ear and an auditory canal leading to an inner ear, said earplug mounting device and radio receiver comprising in combination:

a resilient semi-rigid main body mountable in the outer ear, said main body having a main body passageway therethrough;

a support boom onto which an audio aid can be attached which is releasably connected to said main body so as to be fixedly positioned relative to said main body, said boom having a boom passageway therethrough in acoustic communication with said main body passageway; and

a flexible tube defining an air passageway for carrying sound waves, one end of said tube releasably connected to said boom at said boom passageway, said flexible tube being operably connected at another end to said radio receiver, said flexible tube being in acoustic communication with said boom passageway and said radio receiver whereby sound waves emanating from said radio receiver can be carried through the tube, boom and main body into the auditory canal of an individual utilizing the device.

4,443,669

SUBSCRIBER CONNECTION CIRCUIT

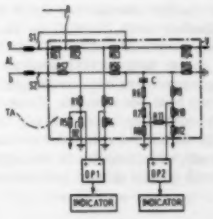
Horst Kopetzky, Unterhaching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,505

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036686

Int. Cl.³ H04M *3/22*

U.S. Cl. 179—175.2 C **5 Claims**

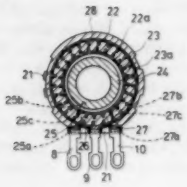


1. A circuit for a subscriber connection arrangement to subscriber lines (a, b) comprising first, second, third and fourth feed resistors connected in series between subscriber line a and a bias voltage, fifth, sixth and seventh feed resistors connected in series between subscriber line b and ground potential, a first switch means connected across said first, second and third feed resistors to short them out, a second switch means connected across said sixth and seventh feed resistors to short them out, first and second voltage divider resistors connected in series between the junction point between said sixth and seventh feed resistors and ground, a first operational amplifier with its non-inverting input connected to the junction point between said first and second voltage divider resistors, third and fourth voltage divider resistors connected in series between the junction point between said second and third feed resistors and ground, and output means connected to said first operational amplifier to monitor the dialing state when said first and second switch means are open.

4,443,670
ROTARY ENCODER CONTACT DISK

Noriaki Nakamura, Shijonawate; Tomio Kishimoto, and Yuichi Yamamoto, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 3, 1981, Ser. No. 317,856
Claims priority, application Japan, Sep. 14, 1979, 54-118472
Int. Cl.³ H01H *1/58, 19/58*
U.S. Cl. 200—11 DA 3 Claims



1. A contact disk for a rotary encoder of the type having a laminated structure and for use with a rotary brush, comprising:

a substrate of insulative material,

a first and a second terminal part of conductive material in layer form, each said terminal part having an inner and an outer end and each having a lead-out terminal at said respective outer ends, isolated from each other on the surface of said insulative substrate,

an insulative film formed partly on the surface of said insulative substrate to cover said terminal parts except for their respective ends,

a slip ring conductive layer formed on the surface of said insulative substrate in a manner to contact with the inner exposed end of said first terminal part,

a first gear-pattern conductive layer having teeth extending radially outwardly therefrom and formed on said insulative film concentrically with and outside of said slip ring conductive layer in a manner to contact with the inner exposed end of said second terminal part, and

a second gear-pattern conductive layer having internally radially extending teeth, formed on said insulative film concentrically with and outside of said first gear-pattern conductive layer, said second gear-pattern conductive layer having on its outer edge an integrally formed terminal part with a lead-out terminal, the angular positions of said radially extending teeth of said first gear-pattern being slightly shifted in a rotational direction of the rotary encoder brush with respect to corresponding radially extending teeth of said second gear-pattern.

4,443,671
FLOW SENSOR

Edward T. Hinds, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 28, 1981, Ser. No. 335,016
Int. Cl.³ H01H *35/24*
U.S. Cl. 200—81 R 5 Claims

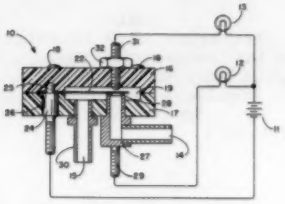
1. A flow sensor for limiting fluid flow to a single direction and providing electrical signals indicating a no flow condition, and intermediate flow condition, and a high flow condition, comprising;

(A) a body formed of an electrically insulating material;

(B) a valve seat member mounted on said body and having a flow passage therethrough, said valve seat member formed of an electrically conducting material to function as a first electrical contact;

(C) a second electrical contact attached to said body; and

(D) a reed valve member having a first end attached to said body and second free end biased to close said passage, said reed valve member formed from an electrically conducting material to function as a third electrical contract for making electrical contact with said first electrical contact when said valve member closed said flow passage and for

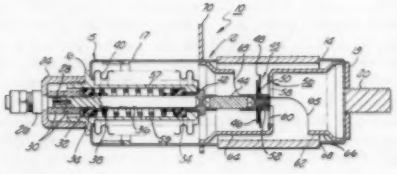


making electrical contact with said second electrical contact when flow through said passage reaches a predetermined level.

4,443,672
LOW CAPACITANCE RADIO FREQUENCY SWITCH

Joseph E. Oeschger, Palo Alto, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,896
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B 4 Claims



1. An RF vacuum switch having open and closed positions comprising:

an envelope having a tubular ceramic portion oriented along a first axis;

a moveable contact disc hermetically sealed within said envelope and including an axially operating bellows for permitting axial motion parallel to said first axis to be imparted to said moveable contact disc by means of a control member external to said envelope;

a pair of fixed contacts within said envelope and positioned with respect to said moveable contact means to operatively engage said moveable contact means when the vacuum switch is in the closed position;

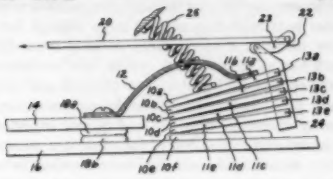
a first cylindrically shaped member within said envelope and extending in a first direction along said first axis away from said pair of fixed contacts for supporting a first one of said fixed contacts; and

a second cylindrically shaped member within said envelope and extending in a second direction along said first axis away from said pair of fixed contacts, said second direction being opposite to said first direction, for supporting a second one of said fixed contacts, said first and second cylindrically shaped members being mounted to said envelope at opposite ends of said ceramic portion, both said first and second cylindrically shaped members having respective cutaway portions respectively in the vicinity of said second and first fixed contacts to minimize capacitance effects between said first and second cylindrically shaped members.

4,443,673
VARIABLE ASPECT ARC CHUTE

James W. Sember, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,429
Int. Cl.³ H01H 33/04, 33/12
U.S. Cl. 200—144 R 8 Claims



1. An arc chute for use in electrical current interrupters comprising:

a stack of plates comprising electrically conductive material, each plate being mounted to pivot about an axis lying substantially in the plane of said plate, each of said axes being substantially parallel to one another;

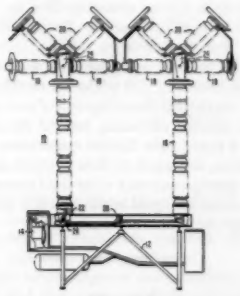
bias means for holding said plates in electrical contact with each other along an edge thereof; and

means for separating said contacting plates.

4,443,674
CIRCUIT INTERRUPTER CLOSING RESISTANCE MECHANISM

Ben J. Calvino, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 31, 1982, Ser. No. 364,038
Int. Cl.³ H01H 33/16
U.S. Cl. 200—144 AP 10 Claims



1. A circuit interrupter comprising:

(a) a pair of cooperable, separable interrupter contacts, at least one of which is movable;

(b) a part of cooperable, separable impedance contacts, at least one of which is movable;

(c) impedance means adapted to be placed electrically in parallel with said interrupter contacts by said impedance contacts;

(d) means for effecting movement of said movable interrupter contact and said movable impedance contact to provide for opening and closing of said interrupter and impdance contacts, said movement effecting means including a rotatable shaft;

(e) mechanical timing means having rigid mechanical operative elements that are rotatively coupled to each other and to said rotatable shaft and, in response to the actuation of said movement effecting means and the rotative interaction between said mechanical operative elements and said shaft, are adapted to control the closing of said impedance contacts at a predetermined time interval relative to the closing of said interrupter contacts;

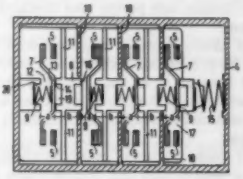
(f) an interrupter contact operating mechanism responsive to said movement effecting means and the rotation of said shaft for opening and closing said interrupter contacts; and

(g) an impedance contact mechanism responsive to the rotative interaction between said rotatable shaft and the coupled mechanical operative elements of said mechanical timing means for closing and opening said impedance contacts in a predetermined time sequence that is controlled by said mechanical timing means and the coupled rotatable shaft of said movement effecting means.

4,443,675
MULTIPLE CONTACT ARRANGEMENT

Johann Drexler, Schwandorf, and Peter Pfauntsch, Regensburg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,910
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146780
Int. Cl.³ H01H 1/20
U.S. Cl. 200—243 2 Claims



1. In a multiple contact arrangement for electromagnetic switchgear including a housing, contact bridge carrier means movably guided from a rest position to an actuated position and having a plurality of windows each having a first and second edge for the support of contact bridge means, said windows being arranged at intervals evenly distributed along the length of said contact bridge carrier means, contact bridge means supported in each of said windows having electrical contact means at each end thereof, said electrical contact means being offset from the central portion of said contact bridge means, fixed electrical contact means for engaging said electrical contact means of said contact bridge means and first partitioning means attached to said housing for separating each of said contact bridge means from each other, the improvement comprising:

second partitioning means attached to said contact bridge carrier means adjacent said first partitioning means and further separating said contact bridge means from each other;

plate means below said contact bridge carrier means from which said second partitioning means extend;

said fixed electrical contact means arranged in linear relation with said second edge of each of said windows when said contact bridge carrier is in said rest position; and

said ends of said contact bridge means each being offset from the central portion of each of said contact bridge means a distance equal to the spacing between said first and second edges;

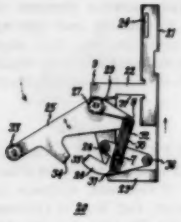
whereby said contact bridge means can be inserted into said windows in either of two orientations, said orientations being 180° opposite each other, so that said electrical contact means of said contact bridge means contacts said fixed electrical contact means in said rest position if it is inserted into said window in one of said orientations and contacts said fixed electrical contacts in said actuated position if it is inserted into said window in the second orientation.

4,443,676

INTERCHANGEABLE SHIELD ARRANGEMENT FOR A CIRCUIT BREAKER COMPARTMENT

Roger N. Castonguay, Terryville, Conn., assignor to General Electric Company, New York, N.Y.

Filed Nov. 18, 1981, Ser. No. 322,348
Int. Cl.³ H02B 11/04
U.S. Cl. 200—304 20 Claims



1. A shield unit for use within a circuit breaker compartment comprising:

fixed shield means for insertion within a circuit breaker compartment between electrical power contacts on said circuit breaker and power stab contacts within said compartment;

moveable shield means connected with said fixed shield means for preventing access to said power stabs when said circuit breaker is at least partially removed from said compartment and for providing access to said power stabs when said circuit breaker is completely within said compartment;

moveable shield operating means including a fixed member for attaching within said compartment and first and second actuator arms pivotally connected with said fixed member for rotation in a first direction when said circuit breaker contacts a part of said first actuator arm and for rotation in a second direction when said circuit breaker is moved out of contact with said first actuator arm; and

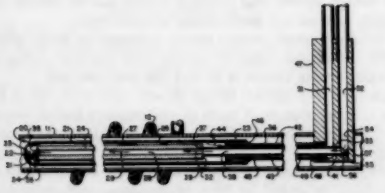
an actuator spring and a return spring opposedly coupled for providing a force to said second actuator arm to rotate said second actuator arm and said first actuator arm in said second direction.

4,443,677

INDUCTION WELDING IMPEDER APPARATUS WITH FLUID COOLING

Fred A. DeSaw, Columbus, Ohio, assignor to Bundy Corporation, Detroit, Mich.

Continuation of Ser. No. 237,463, Feb. 23, 1981, abandoned.
This application Jun. 15, 1982, Ser. No. 388,546
Int. Cl.³ H05B 6/02
U.S. Cl. 219—8.5 24 Claims



1. An impeder useful in induction welding of tubing of small inner diameter, comprising

an elongate circular cylindrical enclosure member having a substantially uniform outer diameter of such size as to fit closely but movably inside a tubing to be welded, a substantially uniform inside diameter, closed at one end, and open at the other end;

an elongate circular cylindrical impeder member, shorter than the enclosure member, having a substantially uniform outer diameter of such size as to fit substantially coaxially inside said enclosure member with space between said enclosure member and said impeder member to provide an outer heat exchange passage large enough for liquid to flow through, a substantially uniform inner diameter of such size as to provide a central heat exchange passage large enough for liquid to flow through, and open at both ends, positioned coaxially inside said enclosure member during operation with one end of said impeder member adjacent said closed end of the enclosure member;

spacing means inside said enclosure member between said closed end thereof and the adjacent end of said impeder member, of such size and shape as to provide an end space large enough for liquid to flow therethrough between said central heat exchange passage and said outer heat exchange passage;

inner tubular means in contact with said other end of said impeder member, having a substantially uniform outer diameter not greater than that of said impeder member and a substantially uniform inner diameter of such size as to provide a central feed passage at least equal in size to said central heat exchange passage in said impeder

member and extending substantially coaxially therefrom for liquid to flow therebetween;

said inner tubular means being held in position fixedly relative to the enclosure member, and said spacing means comprising a compressed elastic member for pressing said impeder member away from said closed end of the enclosure member and into contact with said inner tubular means;

outer tubular means having a substantially uniform inner diameter of such size as to fit substantially coaxially around said inner tubular means with space between said inner and outer tubular means to form an outer feed passage large enough for liquid to flow therethrough, positioned in that manner with one end portion having a substantially uniform outer diameter slightly smaller than the inner diameter of said enclosure member located substantially coaxially within a portion of said open end of the enclosure member extending beyond the impeder member, with a liquid-tight flexible connection to said enclosure member, for liquid to flow between said outer heat exchange passage and said outer feed passage; and

means for conveying liquid in through one feed passage and out through the other feed passage.

4,443,678

METHOD OF INDUCTION BRAZING A COMPLEX ASSEMBLY

Linos J. Jacovides, Birmingham, Mich., and Edward J. Woods, Mentor, Ohio, assignors to General Motors Corporation, Detroit, Mich.

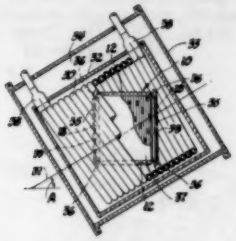
Filed Sep. 20, 1982, Ser. No. 419,941
Int. Cl.³ H05B 5/06
U.S. Cl. 219—10.41 7 Claims

1. A method of induction brazing an assembly including a plurality of elements consisting of core metal clad with a brazing metal which has a slightly lower melting point than the core metal, the elements being generally disposed in at least two transverse planes and intersecting at a junction to be brazed comprising the steps of:

establishing an alternating magnetic field having flux lines extending in a preset direction,

orienting the assembly in the magnetic field with the said planes positioned at respective angles to the flux lines, the

angles being set to cause substantially equal inductive heating of the elements, and



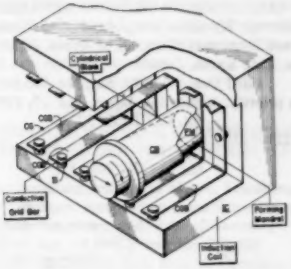
inductively heating the elements by said magnetic field to a uniform temperature sufficient to melt the cladding to form a brazed joint and insufficient to melt the core metal.

4,443,679

INDUCTION FURNACE FOR HEAT SHRINKING THERMOPLASTIC SHEET ONTO MANDRELS IN A FORMING PROCESS

Romano Balordi, Millers, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Filed Jun. 24, 1981, Ser. No. 276,830
Int. Cl.³ H05B *5/04*
U.S. Cl. 219—10.49 R **41 Claims**



1. Means for heat shrinking thermoplastic preforms to a desired shape comprising:

mandrel means of conductive material and said desired shape for receiving a said preform;

induction coil means adjacent said mandrel;

conductive grid means intermediate said mandrel and said induction coil; and

means for energizing said induction coil means for simultaneously heating said mandrel and said grid means;

said grid means applying radiant heat to said preform.

4,443,680

METHODS AND APPARATUS FOR ELECTRICAL DISCHARGE MACHINING

Mohamed F. El-Menshawy, 5 Guiting Rd., Selly Oak, Birmingham 29, and Sushantha K. Bhattacharyya, 35 Chelsea Ct., Abdon Ave., Birmingham 29, both of England

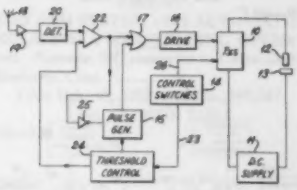
Filed Mar. 31, 1981, Ser. No. 249,406
Claims priority, application United Kingdom, Apr. 2, 1980, 8011003; Apr. 21, 1980, 8013002
Int. Cl.³ B23P *1/08*
U.S. Cl. 219—69 C **11 Claims**

1. An EDM machine comprising:

voltage application means for applying voltages between an electrode and a workpiece to cause sparking in the gap between the electrode and the workpiece,

reference means for generating a variable reference signal which depends on the current in the gap when sparking occurs and which has non-zero values which increase in value with increase in the said current and vice versa at least over part of the range of the said current,

monitoring means for generating a monitoring signal having a value representative of the amount of sparking currently occurring in the gap,



comparison means for comparing the monitoring and reference signals to provide an output signal indicating the onset of arcing when the value of the monitoring signal falls below a variable threshold level determined by the value of the reference signal, and

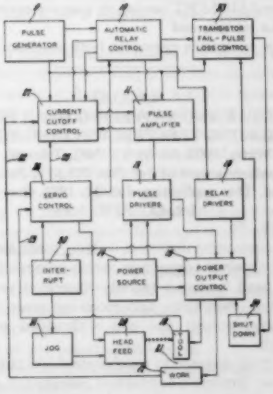
means for, at least partially, controlling the operation of the EDM machine in accordance with the output signal of the comparison means.

4,443,681

ELECTRIC DISCHARGE MACHINE AUTOMATIC RELAY CONTROL

Robert W. Drushel, Farmington Hills, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Sep. 1, 1981, Ser. No. 298,450
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 C **4 Claims**



1. A power supply system for electric discharge machining comprising, in combination, power control means effective to transmit electric power in periodic pulses from a source through an electrode and a workpiece characterized by means responsive to the period of the power pulses effective to vary the energy level of the power pulses over a range of working levels as a function of the said period, and means responsive to such variation of power pulse energy level effective to interrupt the operation of the power pulse transmitting means for a predetermined time to provide time for stabilization of the

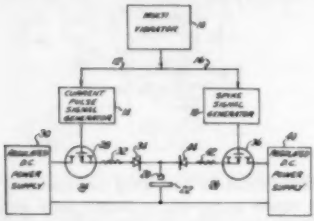
power pulse transmitting means upon a change in power pulse energy level.

4,443,682

SUPERIMPOSED HIGH STRIKING VOLTAGE POWER SUPPLY CIRCUIT FOR ELECTRICAL DISCHARGE MACHINING

Kuang-Ta Ho, Pineville, N.C., assignor to Colt Industries Operating Corp, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,197
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 C **12 Claims**



1. A circuit for providing electrical discharge machining current pulses across an electrical discharge machining gap, having two terminals comprising:

a first MOSFET having its power conducting terminals connected betwen a gap terminal and a DC power supply terminal, said first MOSFET further having its gate connected to a source of variable amplitude pulse signals for selectively varying the slope of the rising edge of the machining current pulses;

a second MOSFET having its power conducting terminals connected with like polarity to the first MOSFET between said gap terminal and a terminal of a second DC power supply of a greater voltage magnitude than the first-mentioned power supply;

said second MOSFET having its gate connected to a source of spike signals; and

means for conjointly operating both said sources.

4,443,683

ANGULAR AND SWIVELING HEAD FOR GAS CONSUMING ELECTRIC WELDING TORCHES

Donald R. Watts, 6004 4th St. Ct. NE., Tacoma, Wash. 98422

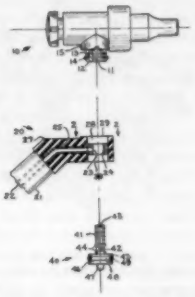
Continuation-in-part of Ser. No. 278,679, Jun. 29, 1981, abandoned. This application Jul. 22, 1981, Ser. No. 286,019
Int. Cl.³ B23K *9/16*
U.S. Cl. 219—74 **3 Claims**

1. A gas consuming electrical welding torch having an angular bend at a swivel connection means comprising:

a torch head having a radially-connected receiving piece extending therefrom, said receiving piece having a surrounding resilient seal and a threaded passage therethrough;

a swivel body adapted to receive electrical current and inert gas flow through a conductive passageway and including an opening for receiving and sealing said receiving piece therein in a swiveling relationship and an electrically conductive seat means connected to said conductive passageway;

a swivel fastener for interconnecting said torch head and said fastener having a threaded stem for threading insertion into said threaded passageway in said receiving piece, an electrically conductive contact plate for engaging said conductive seat means to conduct electrical current from said seat means, through said fastener to said torch head and an annular passageway with radial ports to communicate with said conductive passageway and permit flow of gases into said torch head,



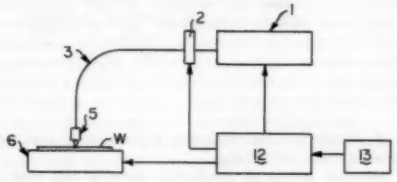
whereby said torch head may be swiveled into convenient operating positions.

4,443,684

CO_2 LASER MACHINING APPARATUS

Shiro Sakuragi; Kyoshiro Imagawa; Haruo Kotani; Mitsunori Saito, and Tomoyuki Haga, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 30, 1981, Ser. No. 335,661
Claims priority, application Japan, Jan. 27, 1981, 56-11069
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LH **11 Claims**



1. A CO_2 laser machining apparatus comprising:

a CO_2 laser oscillator for irradiating CO_2 laser beams,

a stand for placing an object to be machined thereon,

a condenser having a lens means for condensing the CO_2 laser beams onto the object to be machined,

a driving means for transferring said condenser two-dimensionally on said stand,

a control means for controlling said CO_2 laser oscillator and said driving means,

a flexible cable, connected with said CO_2 laser oscillator and said condenser, including a bundle of fibers for transmitting infrared rays perpendicularly through the lens means onto the object to be machined,

at least one further bundle of fibers, optically adjusted to a position to be machined, for transmitting infrared rays aslant through the lens means onto the object to be machined, and

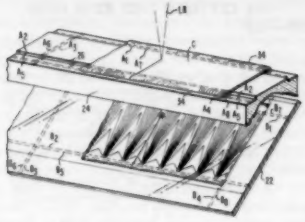
a temperature sensor means for detecting the infrared rays transmitted by the one further bundle of fibers in order to measure temperatures at the position to be machined.

4,443,685

FIXTURE FOR LASER SCRIBING (OF DENDRITE SILICON CELLS)

Edward J. Seman, Elizabeth Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 17, 1982, Ser. No. 349,570
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LH 18 Claims



1. A fixture for holding and aligning a dendritic web silicon cell during laser scribing to delineate the cell from dendrites along the longitudinal edges thereof, comprising

means for supporting the dendritic web silicon cell for alignment with a predetermined pattern on said fixture, so that the cell can be scribed to delineate the cell from the dendrites;

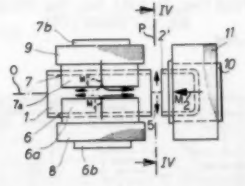
optical receiver-transmitter means associated with said supporting means for visually viewing the predetermined pattern and the portion of the dendritic web silicon cell which is to be delineated from the dendrites so that a laser scribe line can be used to provide a separation mark between the cell and the dendrites.

4,443,686

DEVICE FOR ARC-WELDING FERROMAGNETIC WORKPIECES UNDER THE CONTROL OF A MAGNETIC FIELD

Norbert Pache, Augsburg, and Karel Mazac, Friedberg, both of Fed. Rep. of Germany, assignors to Kuka Schweissanlagen+-Roboter GmbH, Augsburg, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,168
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1981, 3115338
Int. Cl.³ B23K 9/08
U.S. Cl. 219—123 8 Claims



1. A device for welding two workpieces centered on a common axis and separated by a peripheral gap in a transverse plane across which a weld seam is to be formed by an arc moving along said gap, comprising:

holding means for retaining said workpieces in a coaxial position, said holding means including a set of gripper jaws of ferromagnetic material centered on said axis for engaging one of said workpieces;

magnetizing means including excitation coils wound on respective extensions of said jaws perpendicular to said axis for establishing magnetic poles of like polarity at coafronting faces of said jaws, thereby setting up two mutually opposite radially oriented magnetic fields contributing to a flux which permeates the engaged workpiece in an axial direction between said jaws and said gap; and

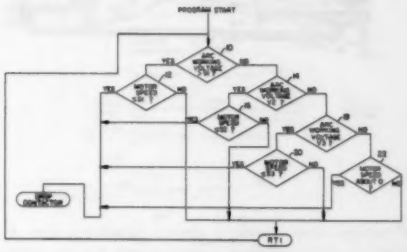
deflecting means adjacent said transverse plane for orienting said flux generally radially across said gap.

4,443,687

METHOD AND SYSTEM FOR AUTOMATICALLY TERMINATING A MIG WELDING OPERATION

Tibor E. Toth, Florence, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 12, 1982, Ser. No. 348,347
Int. Cl.³ B23K 9/10
U.S. Cl. 219—130.21 3 Claims



1. A method for automatically controlling the sequence of termination of a consumable electrode electric arc welding operation in which the consumable electrode is driven toward a workpiece to be welded by a wire feed drive motor under any given set of arc working conditions of wire feed rate, electrode size and arc working voltage with the arc working voltage generated from a welding power supply comprising the steps of :

establishing a finite minimum number of at least two preset combinations of arc working conditions including at least an arc working voltage and/or a motor speed with the first of said preset combination of conditions defining a relatively high arc working voltage and a relatively high wire feed speed and with the last of said preset combination of conditions defining a motor speed equal to relatively close to zero inches per minute;

deenergizing the electrode wire feed drive motor;

monitoring the arc working voltage and motor speed following said deenergization;

comparing in a predetermined sequence said monitored arc working voltage with the arc working voltage in each preset combination to determine if the monitored arc working voltage will satisfy the arc working voltage condition of any preset combination;

selecting the preset combination satisfying the arc working voltage condition;

comparing the monitored motor speed with the motor speed in said selected preset combination;

interrupting the welding power supply when the monitored motor speed equals the motor speed within the selected preset combination; and

when the monitored arc working voltage fails to satisfy the arc working voltage condition of any of the preset combinations then interrupting the welding power supply when the monitored motor speed reaches a predetermined minimum level representing the last preset condition.

4,443,688

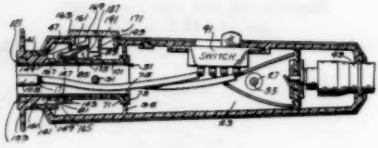
ELECTRICALLY HEATED HAIR CURLING APPLIANCE WITH REMOVABLE ROTATABLE HAIR GROOMING MEMBER

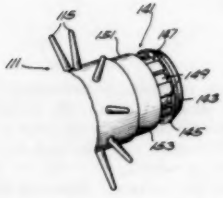
Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Continuation-in-part of Ser. No. 059,676, Jul. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 120,511, Feb. 11, 1980, Pat. No. 4,358,660, which is a continuation-in-part of Ser. No. 222,590, Jan. 5, 1981, Pat. No. 4,368,376. This application Jun. 29, 1981, Ser. No. 278,192

Int. Cl.[3] A45D 2/36; A46D 7/10; H05B 1/00

U.S. Cl. 219—222 17 Claims





1. A hair curling appliance comprising a handle assembly including a handle and a heating element extending fixedly from one end of said handle, a removable tubular member forming at least a part of a hair grooming means located on said heating element for rotary movement and axial movement relative thereto, and means on said handle assembly and on said tubular member and operable selectively for preventing axial and rotary movement of said tubular member relative to said handle assembly, for preventing axial movement of said tubular member relative to said handle assembly, while permitting rotary movement of said tubular member relative to said handle assembly, and for permitting axial and rotary movement of said tubular member relative to said handle assembly to facilitate assembly and disassembly of said tubular member and said handle assembly, said selectively operable means comprising a lever pivotally mounted on said handle assembly and sequentially pivotally movable between a locked position wherein said lever engages a first portion of said tubular member so as to prevent axial and rotary movement between said tubular member and said handle assembly, a roll position wherein said lever engages a second portion of said tubular member so as to prevent axial movement between said tubular member and said handle assembly while permitting rotary movement therebetween, and a slide position wherein said lever is free of engagement with said tubular member so as to permit both axial and rotary movement between said tubular member and said handle assembly, and means for actuating said lever for movement between said positions.

4,443,689

HEATABLE GODET AND A METHOD OF HEATING A GODET

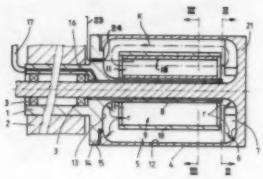
Kurt Müller, Zurich, and Armin Wirz, Ossingen, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Jun. 14, 1982, Ser. No. 388,235

Claims priority, application Switzerland, Jun. 15, 1981, 3914/81

Int. Cl.[3] H05B 3/02; B21B 27/06

U.S. Cl. 219—469 17 Claims



1. A heatable godet comprising

a rotatable drum defining a hollow chamber therein;

a heating means within said chamber of said drum, said heating means including a plurality of air guide ducts for passage of air therethrough, said ducts being disposed within said chamber to define a flow path of U-shaped cross-section as viewed in a circumferential direction with said drum; and

a plurality of fan blades on said drum for circulating air through said flow path during rotation of said drum.

4,443,690

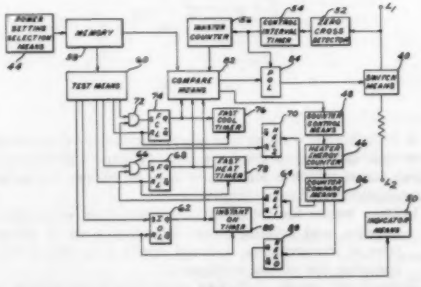
POWER CONTROL FOR COOKING APPLIANCE WITH TRANSIENT OPERATING MODES

Thomas R. Payne, Louisville, Ky., and Alfred L. Baker, Zionsville, Ind., assignors to General Electric Company, Louisville, Ky.

Filed Dec. 23, 1981, Ser. No. 334,038

Int. Cl.[3] H05B 1/02

U.S. Cl. 219—506 13 Claims



1. In a household cooking appliance, a power control system for controlling the power output of a heating element energized by an external power supply in response to a power

setting selected by an operator from a plurality of available power settings, said control system comprising:

power control means for operating the heating element at different selected power levels in response to the selection of different ones of the power settings;

energy counter means;

counter control means for selectively incrementing said energy counter means at one of a plurality of increment rates, each of which is approximately proportional to the rate of increase of the heating element temperature as the element temperature increases from ambient temperature to its steady state operating temperature when operated at corresponding power levels, said one rate being selected according to the power level at which the heating element is being operated; said counter control means being further operative to discontinue incrementing the energy counter means when the count reaches a preselected one of a plurality of maximum counts, each of said plurality of maximum counts being approximately proportional to the steady state heating element temperature for corresponding power levels, said one maximum count being selected according to the selected power setting; said counter control means being further operative to decrement said energy counter means at a predetermined rate when an OFF power setting is selected, said predetermined rate being approximately proportional to the rate of decrease of the heating element temperature when the heating element is deenergized; and

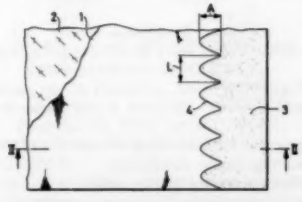
means for detecting a change in the power setting;

said power control means including transient means responsive to said detecting means and said energy counter means for operating said heating element at a power level higher than the operator selected power level for a first relatively short period of time in response to a change from one power level to a relatively higher power level when said count of said energy counter is less than a first predetermined reference value, said first reference value corresponding to a fast-heat threshold temperature, whereby the response time required for the heating element temperature to reach the operating temperature associated with the new power setting is reduced.

4,443,691
ELECTRICALLY HEATED WINDOW

Gerd Sauer, Aachen-Laurensberg, Fed. Rep. of Germany, assignor to Saint-Gobain Vitrage, Neuilly sur Seine, France

Division of Ser. No. 343,985, Jan. 29, 1982, Pat. No. 4,385,226, which is a continuation of Ser. No. 184,272, Sep. 5, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 429,056
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936398
Int. Cl.³ H05B *3/06*
U.S. Cl. 219—522 **5 Claims**



1. An electrically heatable transparent sheet comprising:

a transparent substrate,

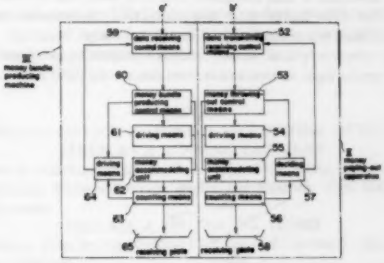
an electrically conductive thin layer with a surface resistance of 1 to 10 ohms per square which is mounted on said transparent substrate, and

current-bearing layer electrodes mounted on and parallel to said thin layer wherein at least one of said electrodes is substantially comprised of a material having a resistivity which is higher than the resistivity of said thin layer and has a surface resistance which varies across the electrode from a region of low resistance at one end to a region of high resistance, which approximates the surface resistance of the thin layer, at the other end of said one electrode that is closer to a second electrode.

4,443,692
CASE ACCOUNTING SYSTEM

Katsuji Nishimura, Habikino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1982, Ser. No. 433,162
Claims priority, application Japan, Oct. 9, 1981, 56-161400
Int. Cl.³ G06R *16/30*
U.S. Cl. 235—379 **1 Claim**



1. A cash accounting system wherein a cash register for registering various money transaction information is electrically connected with a money paying-out apparatus for paying-out money such as papers, coins or the like corresponding to the paying money amount caused by each transacting registration, comprising a money bundle producing machine for paying-out money for each of given amount units and electrically connected with said cash register, and a deciding means for determining whether or not the paying information for each of money denominations corresponding to said payment money amount is a predetermined given amount or more, whereby the money amount of said given amount or less is thrown out of said money paying-out apparatus in accordance with the determining output of said deciding means, and the money of the integer magnification of the given amount is adapted to be thrown out of said money bundle producing machine.

4,443,693
ELECTRO-OPTICAL BADGE READER

Jaroslaw Berezowski, Greenwich, Conn., and Harvey M. Feinman, Bronx, N.Y., assignors to Sealectro Corporation, Mamaroneck, N.Y.

Filed Mar. 8, 1982, Ser. No. 356,046
Int. Cl.³ G06K *7/10*
U.S. Cl. 235—458 **11 Claims**

1. An optical badge reading apparatus for use with a data badge having columns and rows of data apertures and an orientation aperture extending therethrough, said apparatus comprising:

a badge receiving means having a substantially planar slot formed therein and defining an elongated rectangular recess for slidably receiving the data badge, said badge receiving means being provided with a plurality of pairs of registered data sensing apertures extending through said apparatus and across said slot perpendicular to the plane of said slot, said badge receiving means further including an elongated channel on each side of said elongated rectangular recess, each said elongated channel being parallel

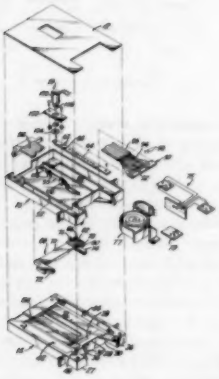
to the longitudinal axis of said elongated rectangular recess;

a light sensitive sensor mounted within one data sensing aperture of each said pair of registered data sensing apertures, and a light source mounted in the other data sensing aperture of each said pair of registered data sensing apertures;

a strobe strip means having a plurality of strobe generating apertures and an end of badge aperture disposed therein, said strobe strip means being disposed in one of said elongated channels parallel to the longitudinal axis of said badge receiving means, and being fixedly attached to said badge receiving means;

an elongated badge bar extending perpendicular to the longitudinal axis of said elongated rectangular recess, the opposite ends of said elongated badge bar being slidably mounted in said elongated channels such that insertion of the data badge into said elongated rectangular recess causes movement of said elongated badge bar;

an electro-optical strobe means comprising at least one strobe light source and at least one strobe light sensor, said



electro-optical strobe means being affixed to said elongated badge bar and disposed in the elongated channel having the strobe bar, such that movement of the elongated badge bar by the data card causes simultaneous movement of said electro-optical strobe means relative to said strobe and end of badge apertures in said strobe strip to create a strobe signal which is detected by said strobe light sensor on said electro-optical strobe means and to detect complete insertion of the badge;

electrical means connecting said electro-optical strobe means, said light sources and said light sensors to a readout device and power source; and

a tubular pull solenoid having a plunger means attached thereto, said tubular pull solenoid being activated upon complete insertion of said data badge into said optical badge reading apparatus to extend said plunger means through said orientation hole retaining said data badge in said optical badge reading apparatus, said plunger means being retracted by said tubular pull solenoid upon receipt of a signal from said power source and said readout device.

4,443,694

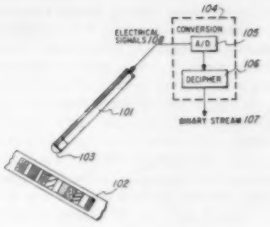
MULTILEVEL BAR CODE READER

Robert F. Sanford, Lubbock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 5, 1981, Ser. No. 318,667

Int. Cl.³ G06K 7/12

U.S. Cl. 235—465 **19 Claims**



1. An electronic apparatus to be used in conjunction with a bar code target, said electronic apparatus comprising:

a. means for generating electronic signals in response to a selected portion of said bar code target;

b. means for generating a selected value level from a hierarchical set of at least three value levels in response to said electronic signals; and

c. means for generating a binary data string corresponding to the difference in hierarchical level between said selected value level and the previous selected value level.

4,443,695

APPARATUS FOR CONTROLLING THE QUANTITY OF LIGHT

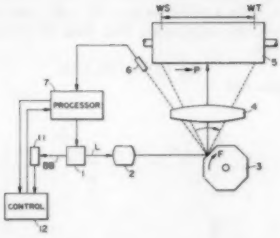
Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1981, Ser. No. 225,345

Claims priority, application Japan, Jan. 25, 1980, 55-7643; Jan. 28, 1980, 55-8621; Jan. 30, 1980, 55-9741; Jul. 17, 1980, 55-98520

Int. Cl.³ G01D 15/14; G01J 1/32

U.S. Cl. 250—205 **18 Claims**



17. Apparatus for controlling the quantity of radiation emitted by emitting means, comprising:

means for generating driving power;

means for emitting radiation in response to the driving power generated by said driving power generating means;

detector means for detecting the radiation emitted from said emitting means and producing a detection signal corresponding to the quantity of the detected radiation;

means for generating a signal for instructing the adjustment of the quantity of radiation emitted from said emitting means;

means responsive to the instruction signal for gradually

varying the driving power after bringing the driving power generating means to a predetermined level; and

means for holding the driving power constant when the detection signal from said detector means reaches a predetermined value.

4,443,696

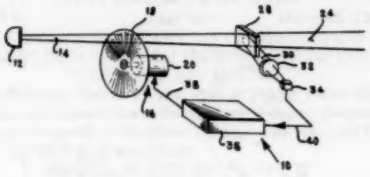
OPTICAL BEAM INTENSITY CONTROL SYSTEM

John Taboada, 12530 Elm Country, San Antonio, Tex. 78230

Filed Aug. 28, 1981, Ser. No. 297,526

Int. Cl.³ G01V *1/20*

U.S. Cl. 250—205 **6 Claims**



1. An optical beam intensity control system comprising:

means in optical alignment with and intercepting a beam of electromagnetic energy for allowing said beam to pass therethrough and for controlling the intensity of said beam passing therethrough in accordance with a predetermined signal, said predetermined signal being based upon a preselected intensity range, and said intensity controlling means including means of variable density interposed within said beam of electromagentic energy and means operably connected thereto for controlling said variable density means in accordance with said predetermined signal;

means in the form of an intensity detector in optical alignment with said beam passing through said intensity controlling means for receiving this beam and providing a signal indicative of said intensity of said beam after having passed through said intensity controlling means; and

means operably connected between said intensity detector and said intensity controlling means for analyzing said intensity signal and providing said predetermined signal to said intensity controlling means, said analyzing means including a threshold control signal generator for receiving said intensity signal and comparing said intensity signal with a set of standards representative of said preselected intensity range whereby when said intensity signal falls within said preselected intensity range said intensity controlling means remains inactive and when said signal falls outside of said preselected intensity range said intensity controlling means is activated until said intensity signal falls within said preselected intensity range.

4,443,697

SYSTEM AND METHOD FOR SELECTING AND SEGREGATING CONTAINERS

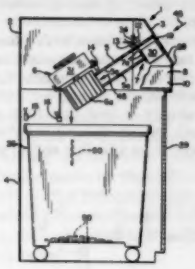
David M. Ryan, No. 25, Canter La., Sherwood, Oreg. 97140, and Paul A. Simmons, Rte. 3, Box 1458, Newberg, Oreg. 97132

Filed Feb. 11, 1982, Ser. No. 348,093

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—223 R **10 Claims**

1. A system for selecting and segregating used, deformable, recyclable containers having a UPC designation thereon, comprising a housing means; and a direct-feed, direct-input, customer-operated, customer-controled input means, said input means comprising an unobstructed entry port for receiving a container from a customer and an input passageway means which provides a straight-line path for a container to travel from the entry port to the confines of the housing means; means for reading the UPC designation on said container; reference guide means for aligning the UPC designation on said container with the UPC designation reading means; and means for maintaining said container in a fixed, stationary



position during said UPC designation reading operation and, if said container is acceptable, for discharging same into the confines of said housing means.

4,443,698

SENSING DEVICE HAVING A MULTICORE OPTICAL FIBER AS A SENSING ELEMENT

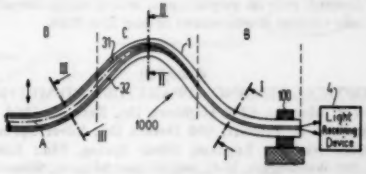
Gerhard Schiffner, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,081

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016104

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **17 Claims**



1. In a sensing device having a sensing element including an optical fiber, means for coupling light into the fiber and means for measuring alterations in specific physical parameters of the light passing through the fiber to determine special physical influences applied to the fiber, the improvements comprising the fiber being a multicore fiber having at least two adjacently extending cores surrounded by a common cladding and one end with an end face provided with a mirror so that light traveling in the cores is reflected at said one end to traverse the cores in the opposite direction; and said means for measuring the alterations in the parameters measuring the changes in the light passing through each of the cores in response to deformation of the fiber.

4,443,699

FLUID LEVEL MEASURING DEVICE WITH LINEAR, HIGH RESOLUTION OUTPUT

Christian A. Keller, Baltimore, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 71,707, Aug. 31, 1979, Pat. No. 4,319,484. This application Jun. 8, 1981, Ser. No. 271,640

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **11 Claims**

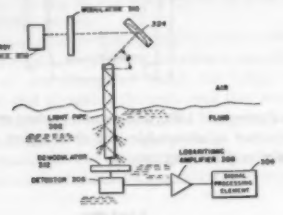
1. An apparatus for providing an instantaneous measurement of the vertical displacement of a first fluid with a first index of

refraction in reference to a second fluid with a second index of refraction, comprising:

a source of a coherent electromagnetic energy beam;

a detector for detecting said coherent electromagnetic energy beam;

an energy conveying means, with a first end in communication with said source and a second end in communication with said detector, with an index of refraction selected to be essentially similar to said first index of refraction, immersed partially in said first fluid and partially in said second fluid, for conveying said coherent electromagnetic energy beam from said first end to said second end;



means for introducing said coherent electromagnetic energy beam into said energy conveying means at an angle which produces reflection in said energy conveying means partially immersed in said second fluid and produces reflection and refraction in said energy convey means partially immersed in said first fluid wherein said refractions cause said coherent electromagnetic energy beam to be logarithmically diminished in said energy conveying means immersed in said first fluid; and

a logarithmic amplifier for converting an output of said detector into an output signal which varies linearly with said vertical displacement of said first fluid.

4,443,700

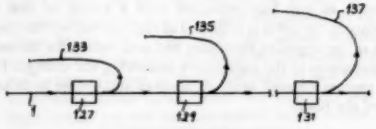
OPTICAL SENSING APPARATUS AND METHOD

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Theodore A. Litovitz, 904 Devere Dr., Silver Spring, Md. 20903; Nicholas Lagakos, Silver Spring, Md.; Robert K. Mohr, Washington, D.C., and Robert Meister, Silver Spring, Md., assignors to Pedro B. Macedo, Bethesda and Theodore A. Litovitz, Annapolis, both of, Md.

Continuation of Ser. No. 117,637, Feb. 1, 1980, Pat. No. 4,342,907, which is a continuation of Ser. No. 859,848, Dec. 12, 1977, abandoned. This application May 13, 1982, Ser. No. 377,904

Int. Cl.³ G02B *5/14*

U.S. Cl. 250—227 **11 Claims**



1. A sensor comprising an optical waveguide having means for transmitting light in at least two groups of modes denoted A and B, a pulsed optical light source means for injecting light into said waveguide so that light transmitted at least initially along said waveguide will be substantially in one of said groups, deformer means responsive to an external stress for deforming more than one spaced apart region of said waveguide with such deformation being effective to change the character of the transmission of at least a portion of the light in the vicinity of the deformation from said one group to the said other group of modes, and an optical detector having means to detect a change in the light in one of said groups in more than one of said regions and thereby monitor said external stress and separate the light from different regions by a time delay introduced because of the spatial separation between regions.

4,443,701

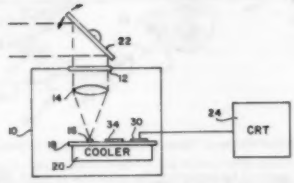
INTEGRATING IR DETECTOR IMAGING SYSTEMS

Gary C. Bailey, Burbank, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 25, 1981, Ser. No. 296,137

Int. Cl.³ G01J *1/00*; H01J *31/49*

U.S. Cl. 250—332 **4 Claims**



1. An integrating IR detector imaging system including a housing for said system and means for cooling said system to a very low temperature during operation, said system comprising

a plurality of InSb mesa diodes in an array fabricated from a single substrate, thereby enhancing diode junction capacitance for the purpose of providing for photocurrent charge integration on the diode junction capacitance of said mesa diodes,

means for focusing an IR image onto said diodes,

multiplexing means for reading out an integrated IR detected signal, one diode at a time, said multiplexing means being comprised of a silicon integrated circuit having much higher leakage resistance in its off state than the leakage resistance of said InSb mesa diodes, and

amplifying means connected to said multiplexing means.

4,443,702

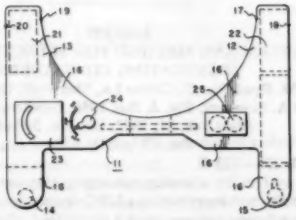
HAND OPERATED LEVEL DETECTOR

Daniel P. Hearn, Richardson, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 19, 1981, Ser. No. 322,781

Int. Cl.³ G01F *23/00*

U.S. Cl. 250—357.1 **1 Claim**



1. An apparatus for detecting the level of a nongaseous substance in a cylinder comprising a measuring means having a portion adapted to be held by hand, said means having at least first and second extensions spaced apart from each other, each of said extensions having length, width, thickness and inner and outer surfaces, said first and said second extensions

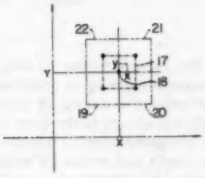
extending in the same direction from said hand-held portion of said measuring means with the inner surfaces of said extensions facing each other, a gamma radioactive source means located on said first extension, a scintillator means for gamma radiation detection located on said second extension, said source means adapted to emit a signal of gamma ray energy which is attenuated by the presence of nongaseous substances and adapted to emit said gamma ray signal toward said scintillator means, and said scintillator means being adapted to receive said radiation signal emitted by said source means and adapted to produce a pulse rate signal correlating to the rate at which gamma ray particles are received by said scintillator means.

4,443,703

METHOD AND APPARATUS OF DEFLECTION CALIBRATION FOR A CHARGED PARTICLE BEAM EXPOSURE APPARATUS

Nobuo Shimazu; Tsuneo Okubo, both of Tokyo; Norio Saitou, Iruma, and Susumu Ozasa, Kashiwa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Hitachi, Ltd., both of Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,719
Claims priority, application Japan, Feb. 23, 1981, 56-24327
Int. Cl.³ H01J *37/304*
U.S. Cl. 250—491.1 **8 Claims**



1. A method of deflection calibration for a charged particle beam exposure apparatus having first deflection means for scanning a relatively large area with a charged particle beam and second deflection means for scanning a relatively small area with said beam, the method comprising:

calibrating deflection performed by said first deflection means; and

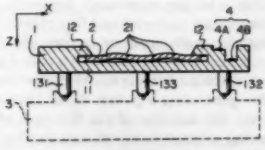
calibrating deflection performed by said second deflection means using said calibrated first deflection means.

4,443,704

METHOD OF ELECTRON BEAM EXPOSURE

Yoshimi Yamashita, and Sumio Yamamoto, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 172,555, Jul. 28, 1980, abandoned. This application Jun. 11, 1982, Ser. No. 387,678
Claims priority, application Japan, Jul. 27, 1979, 54-95839
Int. Cl.³ G01N *21/00, 23/00*
U.S. Cl. 250—491.1 **5 Claims**



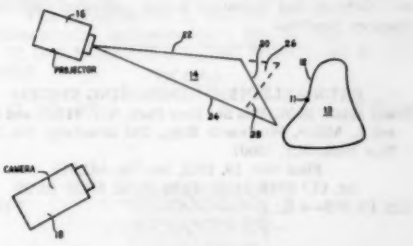
1. A method of electron beam exposure, which automatically effects the focusing of an electron beam by utilizing registration marks on the surface of a specimen, characterized in that plural sets of reference values for setting the conditions for electron beam exposure are obtained in relation to a plurality of sizing marks which are successively arrayed at positions in the vicinity of the pattern area of the specimen, the distance between said plurality of sizing marks in the direction in which the electron beam flows is so selected as to be greater than the magnitude of variation in position on the surface of said specimen, said plural sets of reference values for setting the exposure conditions are stored in a central processing unit, exposing said specimen to an electron beam, detecting bounced signals from the registration marks on the specimen during the actual beam exposure, and setting the exposure conditions corresponding to the registration marks on the surface of the specimen being fed from said central processing unit responsive to variation in focusing which deviates from said reference values for setting exposure conditions when said specimen is being exposed to the electron beam.

4,443,705

METHOD FOR LOCATING POINTS ON A THREE-DIMENSIONAL SURFACE USING LIGHT INTENSITY VARIATIONS

Paul DiMatteo, Huntington, and Joseph Ross, Fort Salonga, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Filed Oct. 1, 1982, Ser. No. 432,267
Int. Cl.³ G01B *11/24*
U.S. Cl. 250—558 **15 Claims**



1. A method for determining projector angles to points on a surface comprising the steps of: irradiating selectively a surface with irradiating volumes having varying intensities defining a first pattern; irradiating said surface with irradiating volumes having varying intensities defining at least a second pattern, a point to be located on the surface being irradiated by said first and second patterns; recording images of said patterns; and scanning said images to find the intensities of said point in the two patterns; determination of projector angle to said point of the surface being dependent on a predetermined algebraic function of the intensities of said point in the two patterns, said point having a possible location where the recorded images have unequal values as well as at a possible location where the recorded images have equal values.

4,443,706

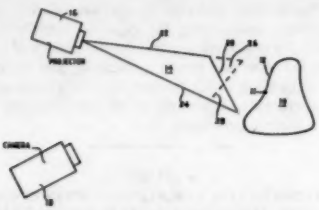
METHOD FOR LOCATING POINTS ON A THREE-DIMENSIONAL SURFACE USING LIGHT INTENSITY VARIATIONS

Paul DiMatteo, Huntington, and Joseph Ross, Fort Salona, both of N.Y., assignors to Robotic Vision Systems, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 432,267, Oct. 1, 1982. This application Feb. 4, 1983, Ser. No. 463,970
Int. Cl.³ G01B *11/24*
U.S. Cl. 250—558 **16 Claims**

1. A method for determining projector angles to points on a surface to provide three-dimensional position information on said points, comprising the steps of: irradiating selectively a

surface with irradiating volumes having varying intensities defining a first pattern; irradiating said surface with irradiating volumes having varying intensities defining at least a second pattern; a point to be located on the surface being irradiated by said first and at least said second patterns; recording images of said patterns; and scanning said images to find the intensities of said point in the at least two patterns, said point having a possible location where the recorded images have equal values



as well as at locations between points where the recorded images have equal values, whereby three-dimensional measurements of points are obtained for an entire region between points of equal values of intensity as well as at points of equal values of intensity; the determination of projector angle to said point on the surface being dependent on a predetermined algebraic function of the intensities of said point in said at least two patterns, said intensities having calibrated singlevalued algebraic functions.

4,443,707

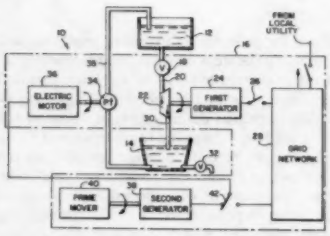
HYDRO ELECTRIC GENERATING SYSTEM

Frank Scieri, 85 W. 18th St., Deer Park, N.Y. 11729, and Richard L. Miller, Woolworth Bldg., 233 Broadway, Ste. 3612, New York, N.Y. 10007

Filed Nov. 19, 1982, Ser. No. 443,049

Int. Cl.³ F01K *23/10*; **F03B** *11/02*; **H02P** *13/20*

U.S. Cl. 290—4 R **7 Claims**



1. A hydro electric generating system comprising, in combination, a reservoir, an impulse turbine, said reservoir being located above said turbine, said turbine including an impeller means, a first conduit means extending downwardly from said reservoir to said turbine for conducting by gravitational fall the water from said reservoir to said turbine impeller means to cause rotation of said impeller means, said impeller means being coaxially connected to a first generator which produces electricity upon rotation of said impeller means, a sump for recovery of energy expanded water as it exits said impeller means, a second conduit means connecting said turbine with said sump for conducting water from said turbine impeller means to said sump in preparation for recovery, a third conduit means connecting said sump to said reservoir with an intermediate pump, said pump being powered by an electric motor, a second generator, a prime mover activating said second generator, an electric grid network, a first switch means for selectively applying the electricity produced by said first generator to said grid network whereby said electricity produced by said first generator can be used directly by a user or fed into the electric grid network, and a second switch means for selectively coupling said electric motor to said electric grid network or to said second generator, whereby said electric motor can be operated by said electric grid network or said prime mover.

4,443,708

APPARATUS FOR STORING THE ENERGY OF OCEAN WAVES

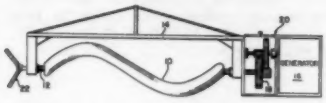
James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation of Ser. No. 373,442, Jun. 25, 1973, which is a continuation-in-part of Ser. No. 148,775, Jun. 1, 1971, abandoned. This application May 19, 1976, Ser. No. 687,678

The portion of the term of this patent subsequent to Jun. 25, 1991, has been disclaimed.

Int. Cl.³ F03C *5/02*

U.S. Cl. 290—53 **1 Claim**



1. Apparatus for manufacturing hydrogen gas from sea water, said apparatus comprising in combination:

means for converting the motion of gravity waves in sea water to electrical energy in the form of DC current and including an elongated bouyant member curved about an axis to form a helix and means for mounting said helical bouyant member for rotation about said axis, said means for mounting including means for suspending said helical bouyant member so as to enable said member to float partially submerged with respect to the crests of said gravity waves;

means for electrolyzing a quantity of sea water, using said electrical energy, to form hydrogen gas;

wherein said axis of said bouyant member is oriented substantially parallel to the approximate mean direction of propagation of said gravity waves.

4,443,709

FREQUENCY RESPONSIVE SYSTEM POWER SEQUENCER

Luther L. Genuit, Scottsdale, and John R. Nowell, Phoenix, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 8, 1982, Ser. No. 366,738

Int. Cl.³ H02J *13/00*

U.S. Cl. 307—41 **4 Claims**

1. A power sequencer for controlling the application of a power signal, via a first plurality of actuator controlled elements to a plurality of equipment cabinets of a system, each equipment cabinet having associated therewith at least one actuator corresponding to one of said first plurality of actuator controlled elements, each actuator operatively connected to said power sequencer and responsive to a coded signal of said power sequencer, the power sequencer comprising:

(a) means for generating a gating signal having a first and second state, the duration of the first state of said gating signal having a predetermined relationship to the frequency of said power signal;

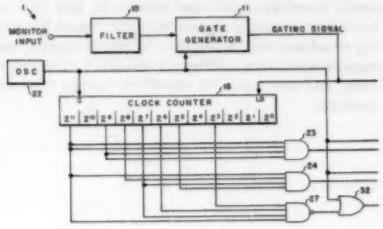
(b) means, having an input terminal adapted to receive a clock signal of a predetermined frequency, for counting said clock signal during an enable period of said means for counting determined by the first state of said gating signal;

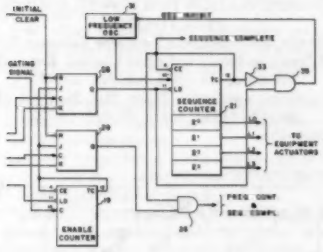
(c) first gate means for combining a first count of said means

for counting, to output a first output signal when a first predetermined frequency threshold value of said power signal is detected;

(d) second gate means for combining a second count of said means for counting, to output a second output signal when a second predetermined frequency threshold value of said power signal is detected; and

(e) means, having a first and second input terminal adapted to receive said first output signal and said second output





signal, respectively, for generating an output signal, whereby said output signal is generated in response to said first output signal thereby initiating a power-on sequence and said output signal is inhibited in response to said second output signal thereby initiating a power off sequence of said equipment cabinets, the output signal having a coded sequence, each actuator being capable of recognizing one of the codes of said coded sequence causing said power signal to be applied to each of the equipment cabinets in a desired sequence.

4,443,710

CONTROL AND MONITORING DEVICE FOR INFLUENCING SAFETY-RELEVANT SYSTEM PARTS OF A POWER PLANT

Horst Hofmann, Bubenreuth, and Karl-Heinz Lochner, Röttenbach, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

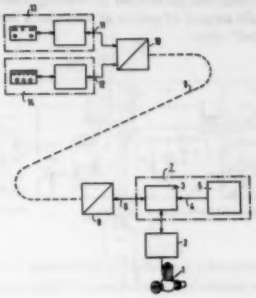
Filed Apr. 14, 1981, Ser. No. 253,905

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1980, 3014421

Int. Cl.³ H02J *1/00;* **G02F** *1/28*

U.S. Cl. 307—80 **2 Claims**

1. Control and monitoring devices for influencing safety-relevant system parts in a power station, comprising at least two rooms being separated from each othr, similar electric circuits disposed in each of said rooms for at least one of giving commands and receiving acknowledgements for influencing a system part, a similar, normally operational power supply being disposed in each of said rooms and being completely electrically separate from each other, electro-optical converters for transmitting signals being disposed in each of said



rooms, and optical wave guide cables connecting said converters to each other.

4,443,711

ELECTRET DEVICE

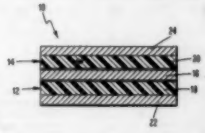
Masamichi Tanaka, Yamato, and Hiroto Wada, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 280,016, Jun. 30, 1981, abandoned. This application Jun. 3, 1983, Ser. No. 500,831

Claims priority, application Japan, Jun. 30, 1980, 55-88781; Jun. 30, 1980, 55-88821; Jun. 30, 1980, 55-88822; Jun. 30, 1980, 55-88823

Int. Cl.³ G11C *13/02*

U.S. Cl. 307—400 **7 Claims**



1. An electret device comprising:

a first electret element having a negatively polarized dielectric layer and a conductive layer, and

a second electret element having a positively polarized dielectric layer and a conductive layer, said second electret element being stacked upon said first electret element with the respective dielectric layers facing each other,

wherein said electret elements each has a relatively uniform surface charge distribution approximately equal to the sum of the respective charge potentials of said electret elements, individually.

4,443,712

SWITCH DEVICE FOR CONNECTING AC POWER SOURCE TO LOAD

Masami Gokita, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 17, 1982, Ser. No. 378,735

Claims priority, application Japan, May 20, 1981, 56-74851

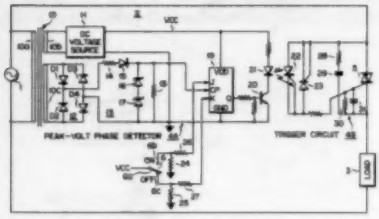
Int. Cl.³ H03K *17/60*

U.S. Cl. 307—140 **8 Claims**

1. A switch device for controlling a bidirectional semiconductor switching element connected between an AC power source and a load, comprising:

means for generating a stream of pulses having a pulse for each positive and negative voltage peak of said AC power source and synchronized therewith;

flip-flop circuit means, having a clock input coupled to said stream of pulses, a control input for controlling whether said flip-flop circuit means is in an "enabled" or a "disable" state, and an output providing pulses synchronized with said stream of pulses at said clock input when in said "enabled" state;



controlled switching means, having a manually operable switch, for providing a control signal to said control input causing said flip-flop circuit means to operate in said "enabled" state in response to said switch being actuated; and

trigger circuit means, responsive to said output pulses of said flip-flop circuit means, for controlling said bidirectional switching element.

4,443,713

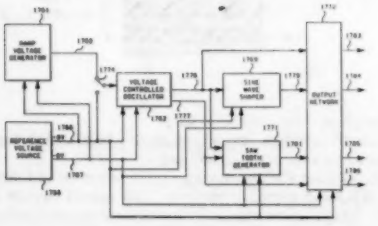
WAVEFORM GENERATOR

James E. Layton, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 105,041, Dec. 18, 1979, Pat. No. 4,305,274, which is a continuation of Ser. No. 955,843, Oct. 30, 1978, abandoned. This application Sep. 24, 1981, Ser. No. 305,291

Int. Cl.³ H03K *3/01, 5/01*

U.S. Cl. 307—260 **33 Claims**



1. Apparatus for generating simultaneously a plurality of output signals comprising:

means for generating a regulated voltage which has a substantially constant voltage level;

means for generating a triangular waveform in response to a voltage input;

means for supplying said regulated voltage as a voltage input to said means for generating a triangular waveform to thereby enable said means for generating a triangular waveform to output a triangular waveform;

means for generating a square waveform in response to a voltage input;

means for supplying said regulated voltage as a voltage input to said means for generating a square waveform to thereby enable said means for generating a square waveform to output a square waveform;

means for generating a sine waveform in response to a triangular waveform;

means for supplying said triangular waveform as an input to said means for generating a sine waveform to thereby enable said means for generating a sine waveform to output a sine waveform;

means for generating a sawtooth waveform in response to a triangular waveform and a square waveform;

means for supplying said triangular waveform and said square waveform as inputs to said means for generating a sawtooth waveform to thereby enable said means for generating a sawtooth waveform to output a sawtooth waveform; and

means for supplying said triangular waveform, said sawtooth waveform, said sine waveform, and said square waveform as output signals from said means for generating simultaneously a plurality of output signals, said triangular waveform, said square waveform, said sine waveform, and said sawtooth waveform having constant frequencies.

4,443,714

SEMICONDUCTOR BUFFER CIRCUIT HAVING COMPENSATION FOR POWER SOURCE FLUCTUATION

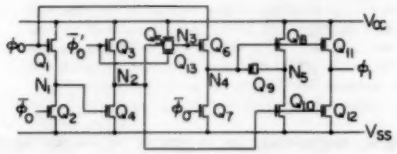
Tomio Nakano, Kawasaki, and Yoshihiro Takemae, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 16, 1981, Ser. No. 331,476

Claims priority, application Japan, Dec. 24, 1980, 55-183075

Int. Cl.³ H03K *5/135, 19/017, 19/096*

U.S. Cl. 307—269 **6 Claims**



1. A semiconductor circuit, used as a buffer circuit and operatively connectable to a power source voltage and to receive an input clock signal, having first and second levels, and an inverted input clock signal, comprising:

an input stage circuit for receiving the input clock signal and the inverted input clock signal, and for generating an output signal at a node, said input stage circuit including a first field effect transistor, having a gate, for charging up said node via its drain-source current path and maintaining the node at a predetermined voltage during a standby period in which the input clock signal is at the first level;

a bootstrap circuit comprising a second field effect transistor operatively connected to said node, for receiving the output signal of said input stage circuit, said bootstrap circuit generating a boosted signal in response to the output signal of said input stage circuit; and

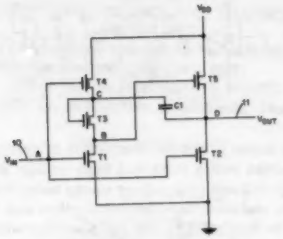
an output circuit, comprising a third field effect transistor operatively connected to said bootstrap circuit, for receiving the boosted signal and for generating an output clock signal;

means for applying a high level clock signal, having the same phase as the inverted clock signal and a level higher than the level of the sum of the power source voltage and the threshold voltage of said first field effect transistor, to the gate of said first field effect transistor, so that, during the standby period, the predetermined voltage of said node is maintained at a level corresponding to the power source voltage by leaking excessive charges at said node through said first field effect transistor to lower the voltage level of said node.

4,443,715
DRIVER CIRCUIT

Jeffrey R. Fox, Concord, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Mar. 25, 1982, Ser. No. 361,714
Int. Cl.³ H03K *3/01, 17/687*
U.S. Cl. 307—270 **6 Claims**



1. A driver circuit comprising
an input terminal for receiving input signals having a first voltage level or a second voltage level;
an output terminal;
a first field effect transistor, an impedance means, and a second field effect transistor connected in series between a source of operating potential and a point of reference potential;
said first field effect transistor being connected to said impedance means at a juncture of said first field effect transistor and said impedance means;
said impedance means being connected to said second field effect transistor at a juncture of said impedance means and said second field effect transistor;
a third field effect transistor and a fourth field effect transistor connected in series between the source of operating potential and the point of reference potential;
said third field effect transistor being connected to said fourth field effect transistor at a juncture of said third field effect transistor and said fourth field effect transistor;
said input terminal being directly connected to the gate electrodes of the first field effect transistor, the second field effect transistor, and the fourth field effect transistor;
the juncture of said impedance means and said second field effect transistor being directly connected to the gate electrode of the third field effect transistor; and
capacitance means connected between the juncture of said first field effect transistor and said impedance means and the juncture of said third field effect transistor and said fourth field effect transistor;
said output terminal being connected to the juncture of said third field effect transistor and said fourth field effect transistor.

4,443,716
SYMMETRICAL-HYSTERESIS HALL SWITCH

Grant D. Avery, Loudon, N.H., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 26, 1982, Ser. No. 342,686
Int. Cl.³ H03K *17/90, 3/26;* **H01L** *43/06*
U.S. Cl. 307—309 **4 Claims**

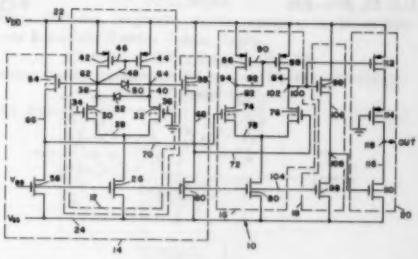
1. A symmetrical-hysteresis Hall switch comprising:
(a) an integrated circuit including a Hall element and a threshold detector means with hysteresis for producing one electrical output condition when the ambient magnetic field normal to said Hall element becomes greater than one value in one magnetic field polarity and another electrical output condition when said ambient magnetic field becomes less than a second and larger value in said one polarity; and
(b) a magnet being fixedly mounted with respect to said integrated circuit and having a relative position and a strength to produce a magnetic field normal to said Hall element of a third value in said one polarity that is essentially equal to the average of said first and second values,

to provide a symmetrical-hysteresis characteristic with respect to any superimposed ambient fields in said one and the other polarity.

4,443,717
HIGH RESOLUTION FAST DIODE CLAMPED COMPARATOR

Yusuf A. Hague, San Jose, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Continuation-in-part of Ser. No. 111,606, Jan. 14, 1980, abandoned. This application Dec. 30, 1981, Ser. No. 335,910
Int. Cl.³ H03K *5/24*
U.S. Cl. 307—362 **6 Claims**



1. An electronic comparator circuit comprising:
a first differential amplifier stage having a relatively high output impedance including:
a first current source;
an inverting input leg containing a load device, an inverting input transistor having an inverting input lead, and a first output node; and
a noninverting input leg containing a load device, a noninverting input transistor having a noninverting input lead, and a second output node;
a second differential amplifier stage having a relatively high input capacitance including:
a second current source, an inverting leg containing a load device and an inverting transistor having an inverting input lead; and
a noninverting leg containing a load device, a noninverting transistor having a noninverting input lead, and a third output node;
an impedance converting stage for reducing the relatively high output impedance of said first differential amplifier stage to drive the high input capacitance of said second differential amplifier stage, said impedance converting stage containing a first and a second leg, said first leg of said impedance converting stage containing a fourth output node, a third current source and a transistor having its control electrode connected to said first output node of

said inverting input leg of said first differential amplifier stage, said fourth output node of said first leg of said impedance converting stage being connected to said noninverting input lead of said second differential amplifier stage, said second leg of said impedance converting stage containing a fifth output node, a fourth current source, and a transistor having its control electrode connected to said second output node of said noninverting input leg of said first differential amplifier stage, said fifth output node of said second leg of said impedance converting stage being connected to said inverting input lead of said second differential amplifier stage;

a level shift stage having an input lead connected to said third output node of said second differential amplifier stage, and having a sixth output node; and

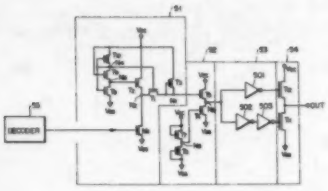
an output stage including a first output transistor having its control electrode connected to said third output node of said second differential amplifier stage, a second output transistor having its control electrode connected to said sixth output node of said level shift stage, a third output transistor having its control electrode connected to a voltage source, and a seventh output node.

4,443,718

NONVOLATILE SEMICONDUCTOR MEMORY WITH STABILIZED LEVEL SHIFT CIRCUIT

Takaaki Hagiwara, Kodaira, and Yuji Yatsuda, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 19, 1980, Ser. No. 188,740
Claims priority, application Japan, Sep. 21, 1979, 54-120639
Int. Cl.³ G11C *17/00, 7/06, 11/40*
U.S. Cl. 307—530 **9 Claims**



1. A nonvolatile semiconductor memory comprising a memory matrix including a plurality of memory cells having nonvolatile memory elements and arranged in the form of a matrix, means for selecting a desired memory cell from said memory matrix, and a read-out circuit for reading out the information stored in the selected memory cell, said read-out circuit including a sense amplifier and an output buffer, said sense amplifier including an inverter having a load element to which a supply voltage is applied and a selected memory cell acting as a driver element, said output buffer including a level shift circuit for shifting the level of an output signal voltage from said sense amplifier, said level shift circuit including means for stabilizing the level of the shifted signal voltage during fluctuations in said supply voltage, and an output driver circuit for receiving the shifted signal voltage from said level shift circuit.

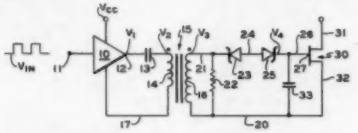
4,443,719

VOLTAGE ISOLATED GATE DRIVE CIRCUIT

Norman G. Planer, Annandale, and Zoltan Zansky, Roseville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 11, 1982, Ser. No. 387,403
Int. Cl.³ H03K *17/10, 17/687*
U.S. Cl. 307—570 **9 Claims**

1. An isolated drive circuit for a high voltage semiconductor device at relatively low switching frequency, including: transformer means including a primary winding and a secondary winding with said primary winding connected to input means; said input means including differentiator means driven by a signal voltage; a field effect transistor including a gate electrode and source-drain means connected to a high voltage source; and said secondary winding connected to said gate through bidirectional voltage breakdown means, and to said



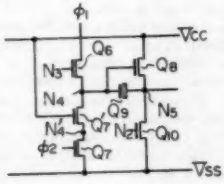
source-drain means to control conduction of current through said source-drain means from said high voltage source; said signal voltage and said high voltage source being isolated from each other by said transformer means to allow said field effect transistor to be controlled by said signal voltage which is small in comparison to the magnitude of said high voltage source.

4,443,720

BOOTSTRAP CIRCUIT

Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 12, 1980, Ser. No. 215,630
Claims priority, application Japan, Dec. 19, 1979, 54-165013
Int. Cl.³ H03K *5/01*
U.S. Cl. 307—578 **9 Claims**



1. In a bootstrap circuit in which a load MOS transistor and a drive MOS transistor are connected in series between a first potential source and a second potential source to form an inverter, with a terminal between said load and drive transistors, a capacitor has a first of two terminals connected to said terminal of said inverter, a circuit for charging said capacitor and a circuit for discharging said capacitor are connected to the other terminal of said capacitor, said circuit for discharging said capacitor being connected between said other terminal of said capacitor and said second potential source and comprising a first MOS transistor which is connected at its source and drain to allow said capacitor to discharge therebetween when said first MOS transistor is rendered conductive by a reset signal that is applied to the gate of said first MOS transistor, the improvement comprising

second MOS transistor connected at its drain and source between said first MOS transistor of said discharge circuit and said other terminal of said capacitor, and

means for continuously supplying a constant voltage to the gate of said second MOS transistor,

wherein the value of said constant voltage is selected to reduce the voltage across said source and drain of said first MOS transistor, during the time that said reset signal is applied to discharge said capacitor, to a value sufficiently below (1) the difference between (a) the voltage of said other terminal of said capacitor and (b) the voltage of said second potential source, (2) less the threshold voltage of said second MOS transistor, so as to sufficiently avoid

the risk of punch-through or breakdown of said first MOS transistor,

wherein said constant voltage is continuously supplied to the gate of said second MOS transistor including during said charging and discharging of said capacitor.

4,443,721

ELECTRODYNAMIC DEVICE FOR TRANSLATING AN OBJECTIVE

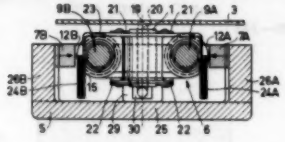
Gerardus L. M. Jansen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1983, Ser. No. 471,972

Claims priority, application Netherlands, Dec. 24, 1982, 8204981

Int. Cl.³ H02K *41/00*

U.S. Cl. 310—14 **7 Claims**



1. An electrodynamic device for translating an objective along a radial path to a disc which rotates about an axis of rotation, which device comprises:

a frame,

a slide which is translatable relative to the frame along said radial path (4) and which carries the objective,

a parallel-guide arrangement for the slide, which arrangement comprises bearing means for guiding the sliding relative to the frame parallel to said path,

at least one permanent-magnetic stator magnet which is secured to the frame, which extends parallel to said path and which is magnetized transversely of said path,

a stator yoke of a magnetizable material, which yoke carries the stator magnet, and

at least one drive coil of an electrically conductive material, which coil is connected to the slide and is translatable in the magnetic field of the stator magnet,

characterized in that:

the parallel-guide arrangement comprises at least one guide rod of a magnetizable material, which rods secured to the frame and carries the slide,

the guide rod forms part of the stator yoke and an air gap is formed between the guide rod and the stator magnet, and

the drive coil is arranged around the guide rod.

4,443,722

ROTOR OF A SUPERCONDUCTIVE ROTARY ELECTRIC MACHINE

Toshiki Hirao, and Kouichi Okamoto, both of Kobe, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,416

Claims priority, application Japan, Jun. 15, 1981, 56-92614

Int. Cl.³ H02K *15/12*

U.S. Cl. 310—45 **2 Claims**

1. A rotor for a superconductive rotary electric machine comprising:

a shaft having longitudinal slots along the outer surface thereof and an end portion at each end with an annular recess therearound;

superconducting field coils in said slots and having circumferentially extending coil end portions in said recesses and spaced in the direction of the length of said shaft;

insulation filler filling the spaces in said recesses between adjacent coil end portions;

keeper sleeves shrink fitted around the end portions of said shaft; and

a laminated insulating cover between each keeper sleeve and the coil end portions and composed of a plurality of thin cylindrical layers adhered to each other, each of said

layers being a thin sheet of a prefabricated single insulating material constituted by at least two insulating plates with the circumferentially facing edges abutting each other at points displaced circumferentially from joints in other layers, said keeper sleeves and cover tightly holding said coil end portions in said recess.

4,443,723

VENTILATION DEVICE FOR A ROTATING ELECTRIC MACHINE

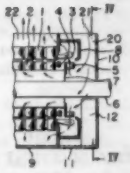
Sumiharu Ohkubo, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,729

Claims priority, application Japan, Jul. 16, 1981, 56-111629

Int. Cl.³ H02K *9/00*

U.S. Cl. 310—53 **3 Claims**



1. In a rotating electric machine having a housing including a side plate, a stator, and a rotor assembly mounted on a rotor shaft extending through said side plate and into said housing in an axial direction, a ventilation-device comprising:

a ventilation guide adjacent an end of said stator and extending axially to a portion facing said side plate, said facing portion of said ventilation guide being axially spaced from said side plate, said ventilation guide and said side plate defining a suction chamber located axially between said side walls and said ventilation guide;

an intake port in said housing at an axial position corresponding to said ventilation guide and said suction chamber;

a discharge port in said housing at an axial position spaced from said suction chamber by said ventilation guide;

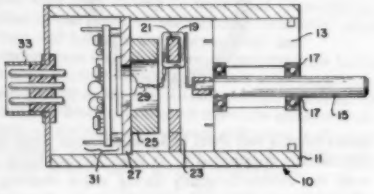
a fan fixed to said rotor assembly and positioned in said ventilation guide; and

a single radially extending whirling stream prevention plate positioned in said suction chamber only at a position spaced from said intake port by said rotor shaft, said whirling stream prevention plate axially extending for substantially the entire axial space between said side plate and said ventilation guide, whereby swirling of air in said suction chamber is prevented.

4,443,724
SHAFT TRANSDUCER HAVING DC OUTPUT PROPORTIONAL TO ANGULAR VELOCITY

Mathias B. Handlykken, Trondheim, Norway, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 19, 1982, Ser. No. 350,475
Int. Cl.³ H02K *17/32*
U.S. Cl. 310—171 **16 Claims**

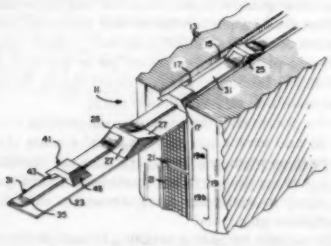


1. A transducer for measuring the angular velocity of a rotatable member such as a shaft, said transducer comprising:
at least one electrical conductor moveable through an arcuate path;
coupling means for coupling said conductor to the rotatable member and for driving said electrical conductor along said arcuate path at a velocity proportional to the angular velocity of the rotatable member;
limiting means for limiting movement of said conductor along said arcuate path to less than, but at least one-half of, a complete rotation;
magnetic circuit means for producing a substantially uniform unipolar magnetic field along said arcuate path of said electrical conductor wherein said magnetic circuit means is composed of an annular magnet and an annular pole piece separated by an annular air gap with said annular magnet, said annular pole piece and said air gap having the same axis of revolution, and with the flux in said air gap being generally parallel to said axis of revolution; and
output means for electrically coupling said at least one electrical conductor to an output.

4,443,725
DYNAMOELECTRIC MACHINE STATOR WEDGE

Scott K. Derderian, Salem, Mass., and James C. Katsekas, Windham, N.H., assignors to General Electric Company, Lynn, Mass.

Filed Jun. 14, 1982, Ser. No. 388,456
Int. Cl.³ H02K *3/48*
U.S. Cl. 310—214 **1 Claim**

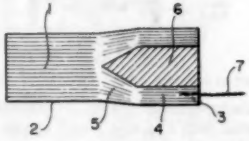


1. An improved dovetail wedge for a dynamoelectric machine wedging system wherein said wedging system includes pressure wedges bearing against stator bars, curling wedges bearing against the pressure wedges and dovetail wedges bearing against the pressure wedges and stator core slot; and, wherein the dovetail wedge improvement comprises: a three ply interlaminar rolled construction including at least two sheets of epoxy-glass plies and one sheet of woven aromatic polyamide fabric, said two glass plies abutting one another and together being wound in spiral form with the polyamide fabric so that the polyamide fabric completely surrounds the glass plies.

4,443,726
BRUSHES AND METHOD FOR THE PRODUCTION THEREOF

Shigeru Ikegami, and Takashi Ohsaki, both of Shizuoka, Japan, assignors to Toho Beslon Co., Ltd.; Japan Marine Machinery Development Assoc. and Sumitomo Heavy Industries, Ltd., all of Tokyo, Japan

Filed May 10, 1982, Ser. No. 376,864
Claims priority, application Japan, May 9, 1981, 56-68911
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—248 **25 Claims**

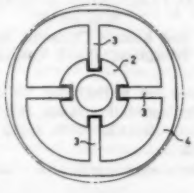


1. A brush for conducting electricity, comprising: a brush portion comprising a bundle of metal-coated carbon fibers disposed substantially in parallel with one another, and a base, said base including a region where said metal-coated carbon fibers are joined together into a composite by diffusion bonding, said base having at least one electrically conductive metallic piece arranged parallel to the bundle of carbon fibers and having one end positioned at an end of said base, wherein the metallic base is a plate-like member having a sharpened end at a side thereof proximate the brush portion.

4,443,727
DEFORMABLE ROTOR FOR A HYDROELECTRIC MACHINE

Heinz Annen, Hägglingen; Friedrich Schneebeli, Oberengstringen, and Helmut Pirchl, Zurich, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Continuation of Ser. No. 226,538, Jan. 19, 1981, abandoned. This application Jun. 2, 1982, Ser. No. 384,258
Claims priority, application Switzerland, Feb. 20, 1980, 1362/80
Int. Cl.³ F16F *15/12*
U.S. Cl. 310—261 **2 Claims**



1. A rotor for a large hydroelectric machine comprising a central hub; radially extending blades; and a rim connecting the outer ends of the blades and having an outer surface portion which has a predetermined noncircular configuration when the rotor is at rest at room temperature, the deviations between said predetermined configuration and a circular configuration corresponding in magnitude and being opposite in

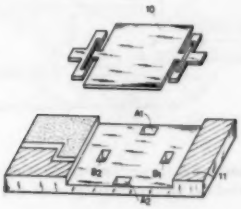
sense to displacements of said surface portion caused by centrifugal and thermal stresses encountered during operation so that, when the rotor is in operation, said surface portion assumes a circular shape, and in which the blades are connected to the hub in radially displaceable manner, and the rim, when resting at room temperature, has a form differing from the circular in such a way that it assumes a circular form only in the rotating state under the influence of centrifugal forces exerted on it by the blades.

4,443,728

GT-CUT QUARTZ RESONATOR

Akihito Kudo, 31-1; Kameido 6-chome, Koto-ku, Tokyo, Japan

Filed Nov. 20, 1981, Ser. No. 323,491
Claims priority, application Japan, May 29, 1981, 56-82133
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—312 **22 Claims**



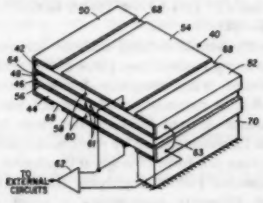
1. A GT-cut quartz resonator unit comprising: a resonator including a vibrating portion having opposed relatively short sides and opposed relatively long sides, at least one supporting portion, and at least one bridge portion connecting said vibrating and supporting portions; and a pedestal connected to the resonator supporting portion to support said resonator, the pedestal having a region spaced from and facing the resonator vibrating portion, and the pedestal region having plural through holes therein facing edge portions of said vibrating portion.

4,443,729

PIEZOCERAMIC BENDER ELEMENT HAVING AN ELECTRODE ARRANGEMENT SUPPRESSING SIGNAL DEVELOPMENT IN MOUNT REGION

Billie F. Rider, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 22, 1981, Ser. No. 276,112
Int. Cl.³ H01L *41/00*
U.S. Cl. 310—330 **7 Claims**



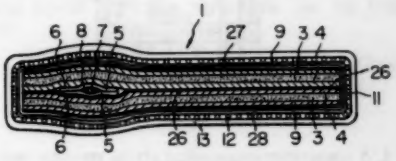
1. A sensor assembly, comprising:
a bender element having
a pair of plates of piezoceramic material, each of said plates having an internal major surface, an external major surface, and a pair of oppositely disposed end walls;
an internal electrode between said plates, said electrode having planar surfaces coextensive and in electrical contact with the internal surface of each of said plates, and end portions coextensive and in electrical contact with the end walls of said plates, the end portions extending over a minor portion of the external major surfaces of said plates adjacent each of said end walls;
a pair of planar external electrodes, each in electrical contact with a major portion of the external surface of a corresponding one of said pair of plates, said external electrodes being electrically isolated from the end portions of said internal electrode, said external electrodes being oppositely disposed from each other on the external surfaces of said plates, said plates being uniformly polarized in a direction normal to said electrodes;
a base member bonded to one of the end portions extending over one of the external major surfaces, said bender element extending in cantilevered fashion from the base member; and
means coupled to said electrodes for detecting an electric field generated between said electrodes when said bender element is subjected to bending force.

4,443,730

BIOLOGICAL PIEZOELECTRIC TRANSDUCER DEVICE FOR THE LIVING BODY

Mitsuaki Kitamura; Toshio Nakayama; Kunio Kamimura, all of Kyoto; Iwao Seo, and Tomonobu Yaguchi, both of Amimachi, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 93,211, Nov. 13, 1979, abandoned. This application May 12, 1982, Ser. No. 377,388
Claims priority, application Japan, Nov. 15, 1978, 53-14659
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—330 **23 Claims**



1. A biological transducer device comprising a flexible organic film like high molecular peizoelectric element having electrode layers secured to both surfaces of opposite sides; a lead wire connected to each of said electrode layers; thin film auxiliary electrodes connected to said lead wires extending along the electrode layers of said piezoelectric element, at least one of said auxiliary electrodes being secured to one electrode layer at one end with the other end being free to allow free to allow free displacement of said one auxiliary electrode; an insulating film formed around the piezoelectric element; shielding mens for shielding the piezoelectric element; and a protective skin covering the exterior of said shielding means whereby the assembly is flexible.

4,443,731

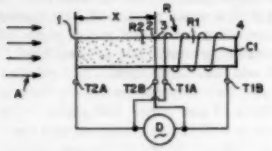
HYBRID PIEZOELECTRIC AND MAGNETOSTRICTIVE ACOUSTIC WAVE TRANSDUCER

John L. Butler, 205 Carolyn Cir., Marshfield, Mass. 02050, and Arthur Clark, 10421 Floral Dr., Adelphi, Md. 20783

Filed Sep. 30, 1982, Ser. No. 430,776
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—334 **16 Claims**

1. A transducer including means for transducing between acoustical energy and electrical energy and comprising; a first element having magnetostrictive properties and associated wiring, a second element having piezoelectric properties and associated wiring mechanical means for combining both said elements into a unitary transducer device, and electrical conductive intercoupling wiring means including conductive wire means for intercoupling wiring of the two elements for receiv-

ing or transmitting acoustical energy in a unidirectional manner for simultaneous excitation or detection of an acoustic



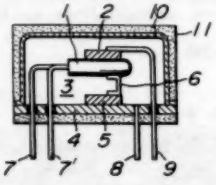
wave, said transducer unidirectionality being established by cancellation of the motion at one end or the pressure on one end of the transducer.

4,443,732

TEMPERATURE-COMPENSATED CRYSTAL RESONATOR UNIT

Hitoaki Hayashi, Tokyo, Japan, assignor to Asahi Dempa Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1983, Ser. No. 520,598
Claims priority, application Japan, Feb. 22, 1983, 58-26921; Mar. 16, 1983, 58-42420
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—343 **4 Claims**



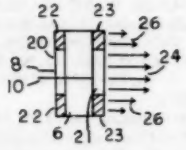
1. A temperature-compensated crystal resonator unit comprising a crystal resonator element housed in a vessel, a first ceramic member attached to the crystal resonator element in a heat-conductive manner, said first ceramic member having a positive temperature coefficient of electric resistance, and a second ceramic member being mounted on said vessel in a heat-conductive manner and being electrically connected to said first ceramic member in series thereto, said second ceramic member having a positive temperature coefficient of electric resistance and being spaced from both said crystal resonator element and said first ceramic member.

4,443,733

TAPERED WAVE TRANSDUCER

Arthur J. Samodovitz, 1860 Alder St. #30, Eugene, Oreg. 97403

Filed Dec. 24, 1981, Ser. No. 334,367
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—369 **20 Claims**



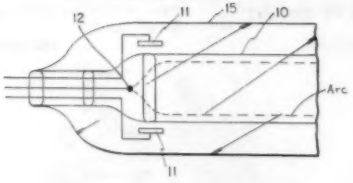
1. A transducer comprising:
a disc-shaped, piezoelectric transducing element, and
first and second electrodes attaching to opposite sides of the transducing element, the first electrode comprising a substantially washer-shaped, resistive region, and a highly-conductive region within the axial hole of said washer-shaped region.

4,443,734

HIGH INTENSITY DISCHARGE LAMP WITH ARC SPREADING MEANS

Leo Gross, 3611 217 St., Bayside, N.Y. 11361, and S. Merrill Skeist, Glen Head, N.Y., assignors to Leo Gross, Bayside, N.Y.

Filed Feb. 4, 1980, Ser. No. 117,950
Int. Cl.³ H01J *61/34, 61/04*
U.S. Cl. 313—26 **4 Claims**



1. A high intensity discharge lamp comprising:
A. an inner envelope having flattened ends and containing a rare gas;
B. electrodes in said inner envelope for creating with said rare gas an arc discharge;
C. arc spreading means associated with the flattened ends of said inner envelope for creating a transverse electric field to spread the arc discharge; and
D. an outer envelope surrounding said inner envelope, said outer envelope having its ends flattened together with the ends of said inner envelope.

4,443,735

DIRECTLY HEATED MESHED CATHODE FOR ELECTRONIC TUBES AND METHOD OF MAKING

Vladimir N. Alexandrov, Chkalovsky prospekt, 14, kv. 25; Vladimir F. Ioffe, Kirovsky prospekt, 69/71, kv. 5, and Oleg V. Filatov, ulitsa Kuibysheva, 1/5, kv. 21, all of, Leningrad, U.S.S.R.

PCT No. PCT/SU80/00215, 371 Date Oct. 2, 1981, 102(e) Date Oct. 2, 1981, PCT Pub. No. WO81/02364, PCT Pub. Date Aug. 20, 1981
PCT Filed Dec. 24, 1980, Ser. No. 308,541
Claims priority, application U.S.S.R., Feb. 5, 1980, 2871003
Int. Cl.³ H01J *1/14, 19/06;* H01K *1/14*
U.S. Cl. 313—345 **7 Claims**

1. A directly heated meshed cathode for electronic tubes, said cathode being made of one piece of metal in the form of a hollow cylinder with integrally formed current-supplying rings provided at respective ends thereof and a perforated working surface defined between the rings by intersecting incandescent filaments spaced by rhomboidal holes, each of the filaments having the form of a spiral conductor interconnecting the respective current-supplying rings, and each of the incandescent filaments constituting a series of successive lengths, each of which being restricted by intersections of said incandescent filament and two other incandescent filaments, each of the spiral incandescent filaments having a discretely varying cross-sectional area along said successive lengths for which purpose each length of the incandescent filaments has at least one step-wise increase in width in a direction from each of the current-supplying rings toward the middle of said incandescent filament.

6. A method of making a directly heated meshed cathode for electronic tubes comprising the steps of:

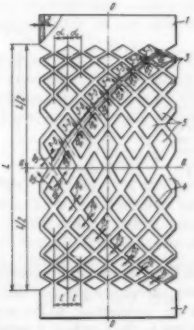
making an electrode tool by performing rhomboidally-shaped projections in the working end of a rectangular metal plate having the length of the working end corresponding to the length of the working surface of the cathode being manufactured;

using the electrode tool thus obtained to broach longitudinal rows of holes in a hollow cylindrical blank of the cathode by electric erosion,

passing said tool parallel to the axis of said blank while also moving said tool radially in the course of the broaching operation relative to the cathode blank;

turning said blank periodically about the axis thereof following every pass of the electrode tool; said method further comprising the steps of:

selecting said rectangular metal plate so that the width of its working end is equal to the double distance between the middle lines of the adjacent longitudinal rows of holes in the cathode being manufactured; and said projections,



cutting blind intersecting grooves in the working end of said plate with a width and location pattern corresponding to the width and location pattern of portions of the incandescent filaments of the cathode being manufactured; thereby to broach open holes in said cathode blank so that following each pass of said electrode tool, full holes of one longitudinal row, a half of the holes of the two longitudinal rows adjoining it on both sides thereof are formed in the cathode blank simultaneously with portions of incandescent filaments of the cathode, spaced by the formed holes and each consisting of filament lengths, each of which being restricted by the intersections of said incandescent filament with two other filaments,

said cathode blank being turned in the turning step, following each pass of said electrode tool, about its axis through an angle equal to twice the angular distance between the middle lines of the longitudinal rows of holes in the cathode being manufactured.

4,443,736

ELECTRON GUN FOR DYNAMIC BEAM SHAPE MODULATION

Hsing-Yao Chen, Landisville, Pa., assignor to RCA Corporation, New York, N.Y.

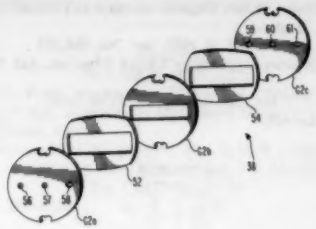
Filed Sep. 23, 1981, Ser. No. 304,784

Int. Cl.³ H01J *29/51, 29/52*

U.S. Cl. 313—414 **2 Claims**

1. In a three inline beam electron gun including three inline cathodes, a control grid having three inline apertures, a screen grid and at least two main focus lens electrodes, the improvement comprising

said screen grid including three stacked apertured metal plates separated from each other by two electrically insulating members, the two outside plates having three inline apertures and the center plate having at least one elongated aperture effectively extending at least to the outer edges of the two outer apertures of the outside plates.



4,443,737

DEVICE FOR DISPLAYING PICTURES BY MEANS OF A CATHODE-RAY TUBE

Maurits W. van Tol, Almelo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,622

Claims priority, application Netherlands, Jan. 14, 1981, 8100142

Int. Cl.³ H01J *29/76*

U.S. Cl. 313—431 **4 Claims**

1. A device for displaying pictures comprising a cathode-ray tube having an evacuated envelope with a display screen and an electron gun for generating an electron beam, which cathode-ray tube has a main system of deflection coils provided around the tube for deflecting the electron beam over the display screen in two mutually transverse directions, characterized in that a second system of post-deflection coils is additionally provided around the display tube located between the display screen and the main system of deflection coils which second system comprises a post-deflection of the electron beam in a direction opposite to that of the main system of deflection coils, which post-deflection is synchronous with but weaker than the deflection produced by the main system of deflection coils.

4,443,738

FLUORESCENT LAMP HAVING SUPPORT WIRES MADE WITH AUSTENITIC STEEL

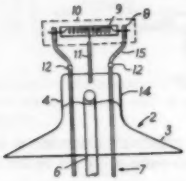
Ashutosh Roy, London, England, assignor to THORN EMI plc, London, England

Filed Jul. 8, 1982, Ser. No. 396,381

Claims priority, application United Kingdom, Jul. 10, 1981, 8121308

Int. Cl.³ H01J 1/62, 5/50, 5/00

U.S. Cl. 313—491 8 Claims



1. A fluorescent lamp comprising a tubular light-transmitting envelope, coil electrodes at opposite ends of the envelope and resepctive electrode support assemblies at said ends of the envelope, each assembly comprising a glass flare sealed into the envelope to form an end wall thereof and electrode support wires extending through and sealed in the flare, the support wires at least in the regions thereof adjacent the electrode, being formed of an austenitic steel maintaining its austenitic microstructure at the operating temperature of said regions when the lamp is in use.

4,443,739

ELECTRIC DEVICE COMPRISING AT LEAST ONE LOW-PRESSURE MERCURY VAPOR DISCHARGE TUBE

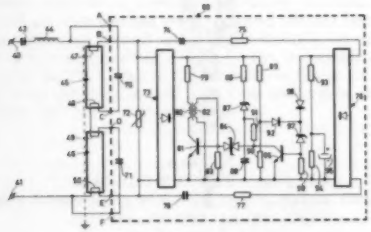
Leonard Woldring, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 25, 1982, Ser. No. 352,505

Claims priority, application Netherlands, Mar. 23, 1981, 8101408

Int. Cl.³ H05B 37/00

U.S. Cl. 315—244 7 Claims



1. An electric device comprising, at least one low-pressure mercury vapour discharge tube, two input terminals for connection to an a.c. voltage source at a frequency of 50 to 60 Hz, means interconnecting said input terminal by means of a series arrangement of the low-pressure mercury vapour discharge tube, a capacitor and a coil wherein the capacitor impedance is greater than the coil impedance at the source frequency, and wherein in the tube operating condition the overall arc voltage of the low-pressure mercury vapour discharge tube (tubes) is between 80% and 110% of the nominal voltage between the input terminals, characterized in that each low-pressure mercury vapour discharge tube which forms part of the series arrangement is of a type which:

(a) if operated by means of a reference ballast has a lamp α in the range between 0.5 and 0.85 if the rms voltage between two ends of a series arrangement formed by the reference ballast and the low-pressure mercury vapour discharge tube is approximately twice the arc voltage of the discharge tube; and

(b) in the presence of the nominal voltage between the input terminals of the electric device has a required reignition voltage which is less than 170/n% of the effective nominal voltage between the input terminals of the electric device, wherein n represents the number of low-pressure mercury vapour discharge tubes in the series arrangement of the electric device.

4,443,740

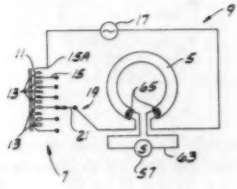
DIMMER SWITCH FOR A FLUORESCENT LAMP

Charles D. Goralnik, 200 Brynwyck Pl., St. Louis County, Mo. 63141

Filed Apr. 9, 1982, Ser. No. 366,872

Int. Cl.³ H05B 41/38

U.S. Cl. 315—284 3 Claims



1. Dimmer means for a fluorescent lamp fixture, said fixture comprising a housing carrying a gaseous discharge light bulb, and having means for connection to an electrical outlet, a tapped ballast inductor in the housing, a series of fixed switch contacts in the housing, conductors in the housing interconnecting the taps of the inductor and said contacts, a movable switch contact mounted in the housing for movement into contact selectively with said fixed contacts, said movable switch contact having an operating member extending out through a slot in the housing, the inductor having an end terminal interconnected with said connection means, and the movable switch contact and bulb being interconnected with said connection means for connecting the inductor and the bulb in series via the movable switch contact with the connection means.

4,443,741

DRIVE CIRCUIT FOR ELECTROLUMINESCENT ELEMENT

Katsuyuki Tanaka, Kamakura; Shin-ichi Ohashi, Chigasaki; Masakatsu Saito, and Tohru Sampei, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 66,653, Aug. 15, 1979. This application Sep. 14, 1981, Ser. No. 301,944

Claims priority, application Japan, Aug. 21, 1978, 53-100924

Int. Cl.³ H05B 37/02

U.S. Cl. 315—307 9 Claims

1. A circuit for driving a dispersion type electroluminescent element whose brightness of luminescence can be changed by changing a voltage applied to said electroluminescent element and can be kept constant by keeping the current flowing through said electroluminescent element constant, said circuit comprising:

a drive power source having an oscillator and a voltage-controlled ac amplifier;

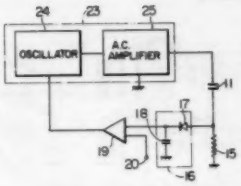
means for applying the output of said drive power source to said electroluminescent element through an electrical current path to provide an electric current flow through said electroluminescent element;

a current detecting element electrically connected with said electrical current path for detecting the current flowing through said electroluminescent element;

a rectifying circuit for rectifying a voltage induced in said current detecting element;

a comparator for comparing the output voltage of said rectifying circuit with a reference voltage to provide an output voltage corresponding to the difference therebetween; and

means for applying the output voltage of said comparator to said voltage-controlled ac amplifier to control the gain of said ac amplifier, thereby keeping the current flowing through said electroluminescent element constant.



4,443,742

PHASE LOCKED LOOP MOTOR CONTROL SYSTEM

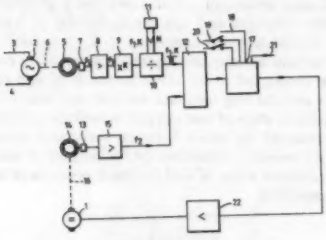
Siegfried Schneider, Biebertal, Fed. Rep. of Germany, assignor to Gestetner Manufacturing Limited, London, England

Filed Nov. 30, 1981, Ser. No. 326,070

Claims priority, application United Kingdom, Dec. 2, 1980, 8038559

Int. Cl.³ G05B *1/06*

U.S. Cl. 318—85 **12 Claims**



1. A phase locked loop motor control system for controlling a motor including inductive windings having a self-inductance, comprising:

pulse encoder means responsive to operation of said motor for generating an output signal indicative of operation of said motor;

generating means for generating a comparison signal with which operation of said motor is to be phase locked;

comparing means for comparing said comparison signal with the output signal of said pulse encoder means, and for generating and providing to said motor a pulsed d.c. supply in accordance with the comparison of said comparison signal with the output signal of said pulse encoder means; and

pulse-shaping means responsive to the self-inductance of said inductive windings of the motor for shaping said pulsed d.c. supply so that it comprises a succession of d.c. drive pulses having a first polarity and a first amplitude, and a succession of d.c. braking pulses having a second polarity and a second amplitude, said second polarity being opposite to said first polarity, and said second amplitude having a smaller modulus than said first amplitude and also being directly proportional to a rate of decay of current at the end of each said drive pulse, wherein the drive pulses and the braking pulses occur alternatively in sequence.

4,443,743

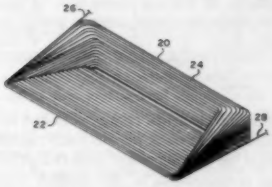
TWO AXIS ACTUATOR

Edward L. Forys, Covina, and Richard M. Malueg, Glendora, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation of Ser. No. 948,795, Oct. 5, 1978, abandoned. This application Nov. 13, 1981, Ser. No. 321,257

Int. Cl.³ H02K *41/00*

U.S. Cl. 318—115 **12 Claims**



1. A multiaxis actuator capable of generating force along a plurality of axes for use in inertial stabilization systems comprising:

a. means for generating a magnetic field between a pair of spaced-apart, opposed magnetic poles;

b. a platen disposed between the poles and aligned generally orthogonally to said magnetic field;

c. a plurality of individual current carrying windings attached to said platen and aligned along different selected orientations relative to each other, each winding having a plurality of loops providing current paths with corresponding first sides being disposed in a generally planar configuration along said platen and positioned within a central field region between said poles and with corresponding second sides being stacked in a generally nonplanar configuration along an edge of said platen outside said central field region to develop a net reactive force between said field and a magnetic field developed by current in said each winding: and

d. at least two of said windings being oriented such that the current in either winding flows in a path having a portion thereof transverse to the path of current flow in the other winding.

4,443,744

METHOD AND APPARATUS FOR CHARGE ENHANCEMENT OF A COMMUTATING CAPACITOR

Charles E. Konrad, Roanoke, Va., assignor to General Electric Company, Salem, Va.

Filed Dec. 27, 1982, Ser. No. 453,559

Int. Cl.³ H02P *3/08*

U.S. Cl. 318—269 **10 Claims**

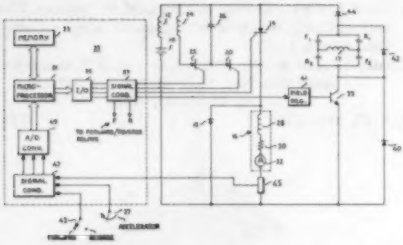
1. For use with a control thyristor adapted to control power to a separately excited motor operable in a motoring mode and in a braking mode, a method for assuring commutation of the thyristor following return of motor operation to a motoring mode from a braking mode, said method comprising the steps of:

(a) providing a commutating network including a commutating capacitor, a commutating thyristor, and a charge reversal thyristor arranged such that an electrical charge of sufficient magnitude stored on the commutating capacitor will cause commutation of said control thyristor following a sequential gating of said charge reversal thyristor and said commutating thyristor;

(b) sensing whether the motor is operating in the braking mode;

(c) maintaining the control thyristor in a nonconducting state during the braking mode of operation; and

(d) alternately gating the commutating and charge reversal thyristors into a conduction state during the braking mode



to cause the electrical charge acquired by the commutating capacitor to track the electrical current drawn by the motor in the braking mode, such charge being sufficient to assure commutation of the control thyristor upon the motor resuming operation in the motoring mode.

4,443,745

ROTATION SIGNAL DETECTION DEVICE OF DC MOTOR WITH BRUSHES

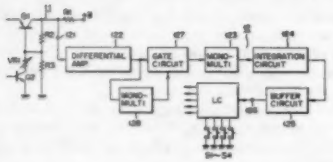
Akira Seino; Kazuo Takamori, and Kaoru Morinaga, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 9, 1981, Ser. No. 300,480

Claims priority, application Japan, Sep. 12, 1980, 55-126753; Nov. 20, 1980, 55-163924

Int. Cl.³ G05B *5/00*; H02H *7/08*

U.S. Cl. 318—461 **3 Claims**



1. A rotation control device for a DC motor with brushes, comprising:

a motor driving circuit including means for receiving DC power and providing driving signals to said DC motor said driving circuit including switching means for ON/-OFF control of the driving signals to the DC motor;

detecting means, coupled to said motor driving circuit, for providing a commutation pulse signal component of current flowing through said motor driving circuit to said motor;

means for generating, in response to said commutation pulse signal component, a reference pulse signal having a period longer than the normal period of the commutation pulse signal component;

a gate circuit for gating the commutation pulse signal component from said detecting means, said gate circuit being gated in response to said reference pulse signal so as to be open during the period of the reference pulse signal; and

means, coupled to an output of said gate circuit, for generating a control signal for rendering said switching means of said motor driving circuit OFF, to stop rotation of said motor when no commutation pulse signal component passes through said gate circuit.

4,443,746

CONTROL CIRCUIT FOR STEPPING MOTOR

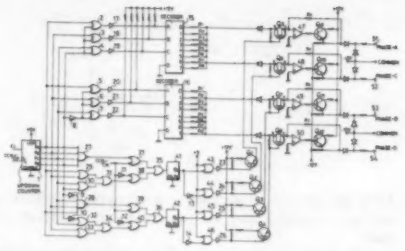
Shigeru Araki, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,441

Claims priority, application Japan, Sep. 6, 1980, 55-122943

Int. Cl.³ H02K *29/02*

U.S. Cl. 318—696 **3 Claims**



1. A control circuit for a stepping motor, comprising an up-down counter receiving a reference clock signal and a control signal consisting of rotating-direction indicative signals and executing a count operation with said reference clock signal and having countup and countdown change by said rotating-direction indicative signals, a distributor circuit determining an excitation sequence for respective phases of the polyphase stepping motor in accordance with a count output of said counter, and a stepped wave generator circuit generating a stepped waveform exication signal in accordance with the count output of said counter, an excitation state of each phase of said stepping motor being controlled in a stepped waveform consisting of a plurality of steps, wherein said stepped wave generator circuit comprises a decoder receiving said count output of said counter, a plurality of resistors each having its one terminal connected to a corresponding one of outputs of said decoder, and operational amplifiers each having its input connected to the other terminals of said plurality of resistors and ahaving feedback resistor, and wherein levels of the respective steps of said stepped waveform excitation signal are determined by ratios between resistance values of the respective resistors connected to the outputs of said decoder and a resistance value of said feedback resistors of said operational amplifiers.

4,443,747

TRANSITIONING BETWEEN MULTIPLE MODES OF INVERTER CONTROL IN A LOAD COMMUTATED INVERTER MOTOR DRIVE

B. Paul Chausse, Roanoke; Paul M. Espelage, Salem, both of Va.; David L. Lippitt, Scotia, and Leland C. Tupper, Schenectady, both of N.Y., assignors to General Electric Company, Salem, Va.

Filed Apr. 1, 1982, Ser. No. 364,453

Int. Cl.³ H02P *1/46*

U.S. Cl. 318—723 **46 Claims**

1. A method of controlling an AC motor over its operating range by means of a source side converter coupled from an AC source to a load side converter by way of a DC link circuit wherein the load side converter is operable in multiple operational modes to control the AC motor, comprising the steps of:

(a) maintaining said load side converter in an idle mode of operation when said motor is in an at-rest state or in a coasting operating state;

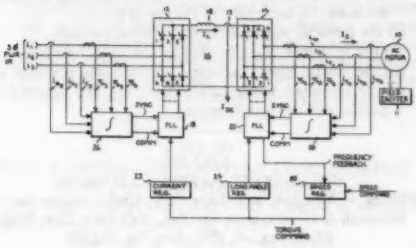
(b) sequentially transitioning said load side converter when said motor is initially in the at-rest state;

(1) from said idle mode to a first type forced commutation mode of operation, by causing current in the DC link

circuit to be substantially zero, to initiate operation of said motor load from the at-rest state, and

(2) from said first type forced commutation mode to a second type forced commutation mode of operation following initiation of operation of said motor, and,

(3) from said second type forced commutation mode of operation to a self-commutation mode of operation



when a predetermined operating state of said motor exists, and

(c) selectively transitioning said load side converter from said idle mode when said motor is in the coasting operating state to a one of said second forced commutation mode of operation and said self-commutation mode of operation as a function of prescribed values of motor speed.

4,443,748

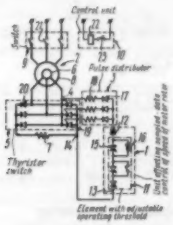
METHOD OF CONTROLLING SPEED OF AT LEAST ONE INDUCTION MOTOR AND DEVICE THEREFOR

Vladimir S. Boev, Kashirskoe shosse, 128, Kv. 131; Sergei P. Golev, ulitsa Novinki, 4, kv. 68; Viktor I. Dmitriev, ulitsa Vysokaya, 13, kv. 10; Efim M. Pevzner, ulitsa Generala Belova, 53 korpus 2, kv. 182; Andrei G. Yaure, ulitsa Kusiren, 9, kv. 114, and Lev B. Masandilov, 2 Yuzhno-portovy proezd, 13, kv. 57, all of Moscow, U.S.S.R.

Filed Mar. 16, 1981, Ser. No. 244,138

Int. Cl.³ H02P 7/40

U.S. Cl. 318—732 **4 Claims**



1. A device for controlling the speed of at least one induction motor having a stator winding and a rotor winding and comprising:

a power supply;

a switch having a first input, a second input and an output and connected via its first input to said power supply and via its output to said stator winding of said motor;

a first control unit having an input, and an output coupled to the second input of said switch;

at least one resistor electrically coupled to said rotor winding of said rotor;

a thyristor switch having an input, a control input, a first output coupled to said rotor winding of said motor, and a second input;

a pulse distributor having an input and an output and connected via its output to said control input of said thyristor switch;

a unit effecting sampled-data control of the speed of said rotor of said motor and comprising an element with an adjustable operating threshold having an input, a control input and an output and electrically coupled via its input to the output of said thyristor switch, and a pulse shaper connected to said output of said element and to the input of said pulse distributor;

a load setter for said motor having a first output and a second output and connected via its first output to said input of the first control unit;

an OR gate having a first input, a second input and an output and connected via its first input to the first output of said load setter for said motor, via its second output to the second output of said setter and via its output to said control input of said element having an adjustable operating threshold;

a switch effecting dynamic braking of said motor having a first input, a second input, a third input and an output and connected via its first and second inputs to the first and second outputs of said thyristor switch, respectively, and via its output to said stator winding of said motor; and

a second control unit having an input and an output and connected via its input to the second output of said load setter for said motor and coupled via its output to the third input of said switch effecting dynamic braking of said motor.

4,443,749

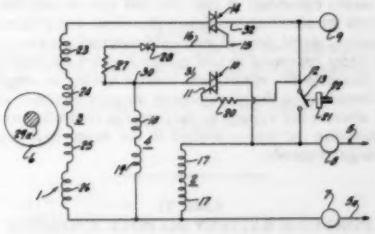
MULTIPLE SPEED SPLIT-PHASE INDUCTION MOTOR

Robert H. Douthart, Burlington, N.C., and Howard W. Smith, West Carrollton, Ohio, assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Oct. 7, 1982, Ser. No. 433,214

Int. Cl.³ H02P 1/42

U.S. Cl. 318—774 **6 Claims**



1. A multiple speed split-phase induction motor comprising a first speed winding means, a second speed winding means, a start winding means, three power terminals including a first power terminal connected to the first speed winding and a second power terminal connected to the second speed winding and a common power terminal connected to said first and second speed windings and start winding means, a solid state gated start switch means connected in series with said start winding means, a solid state gated run switch means connected in series with said second speed winding means, a speed responsive switch means connecting the circuit of the start winding means to said first power terminal for de-energizing of said start winding means at a selected speed, and said solid state gated start switch means and said solid state gated run switch means each having an input gate and said input gates being connected in a control circuit to said second power terminal and said speed responsive switch means and including means to limit the firing of the solid state gated run switch means and conjointly operable to simultaneously energize said first speed winding and said start winding during an initial start period and responding to said de-energizing of said start winding to

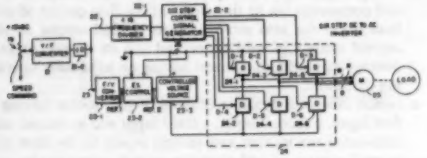
energize only one of said first speed winding and said second speed winding in accordance with the power connection to said first and second power terminals.

4,443,750

ENERGY SAVING MOTOR SPEED CONTROLLER

Edgar Altenu, Trumbull, Conn., assignor to Zero-Max Industries, Incorporated, Minneapolis, Minn.

Filed Apr. 30, 1980, Ser. No. 145,244
Int. Cl.³ H02P 5/40
U.S. Cl. 318—808 **11 Claims**



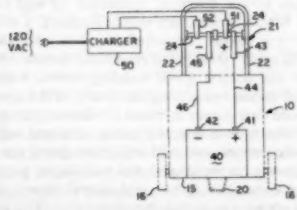
1. A controlled power supply for an AC motor comprising:
(a) means for deriving a feedback signal proportional to motor load current;
(b) means for generating a signal having a characteristic which is proportional to desired motor speed;
(c) means, connected to said deriving means, for amplifying and integrating said feedback signal;
(d) a first variable gain amplifier circuit connected to the feedback processing means to receive and amplify the processed feedback signal, and connected to said speed signal generating means in such manner as to render the gain of the amplifier circuit proportional to said characteristic of the speed signal;
(e) a second variable gain amplifier circuit connected to said speed signal generating means, in parallel to said first amplifier circuit, to receive and amplify said speed signal;
(f) means connected to said first and second amplifier circuits for summing the signals therefrom and producing a control signal derived from said summed signals;
(g) means connected to said summing means for supplying a voltage to the motor, said voltage having an amplitude dependent on the magnitude of the control signal; and
(h) wherein the voltage to the motor is controlled so as to minimize the power applied to the motor over a given range of speeds.

4,443,751

PORTABLE BATTERY BOOSTER ASSEMBLY

Wayne R. Humphrey, Moline Acres, Mo., assignor to Associated Equipment Corporation, St. Louis, Mo.

Filed May 28, 1982, Ser. No. 382,817
Int. Cl.³ H02J 7/00
U.S. Cl. 320—2 **7 Claims**



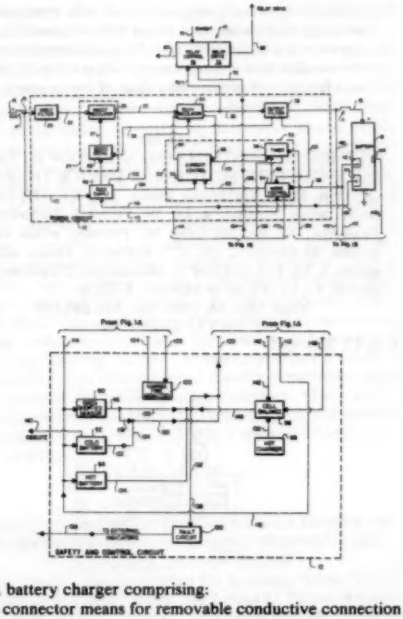
1. A portable battery booster assembly comprising:
(a) a booster battery having positive and negative electrical connections,
(b) a portable means carrying the booster battery,
(c) a negative booster clamp electrically connected to the booster battery negative connection,
(d) a positive booster clamp electrically connected to the booster battery positive connection,
(e) a pair of electrically conductive terminals carried by the portable means, each terminal selectively receiving one of the booster clamps for providing an electrical connection between the terminal and the battery,
(f) the portable means including a handle means,
(g) the terminals being carried by the handle means,
(h) the handle means including opposed side portions, and
(i) the terminals being carried between the opposed side portions of the handle means.

4,443,752

SOLID STATE BATTERY CHARGER

William A. Newman, Salt Lake City, Utah, assignor to Utah Research & Development Co., Inc., Salt Lake City, Utah

Filed Aug. 30, 1982, Ser. No. 412,955
Int. Cl.³ H02J 7/04
U.S. Cl. 320—22 **10 Claims**



1. A battery charger comprising:
first connector means for removable conductive connection to an external source of variable voltage direct current power;
second connector means for removable conductive connection to a chargeable battery;
sensing means positioned and connected to sense selected variable parameters of said battery; and
a power circuit conductively connected to said first connector means to receive power therefrom and conductively connected to said second connector means to supply a multi-mode charging current to said battery, said power circuit including:
boost means conductively connected to said first connector means to receive said external power therefrom and to said second connector means to receive a signal reflective of battery voltage to boost the voltage of the received external power to a level no lower than a

preselected level above battery voltage when received voltage is below said preselected levels,

current-mode regulating means conductively connected to said sensing means to receive signals reflective of selected variable parameters of said battery to sense the state of charge of said battery to supply current and mode regulating signals,

a buck regulator conductively connected to receive the output of the boost means and to said current-mode regulating means to receive current and mode regulating signals to supply a multi-mode charging program having a constant charging current in each mode, and

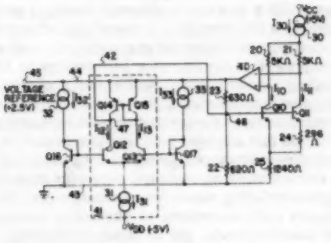
bias supply means conductively connected to said external power to receive power therefrom and to selected circuits of said power circuit to supply power thereto.

4,443,753

SECOND ORDER TEMPERATURE COMPENSATED BAND CAP VOLTAGE REFERENCE

Gerard F. McGlinchey, Cupertino, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Aug. 24, 1981, Ser. No. 295,952
Int. Cl.³ G05F *3/20*
U.S. Cl. 323—313 **12 Claims**



1. A voltage reference circuit comprising

means for generating a bandgap voltage reference temperature compensated to the first order, said voltage reference having a component voltage having a second order temperature dependency,

means for generating a current having a second order temperature dependency as said component voltage,

means responsive to said current for generating a correction voltage having said second order temperature dependency,

means for combining said first order temperature compensated bandgap voltage reference and said correction voltage so as to cancel said component voltage,

whereby said combined voltage reference and said correction voltage provide a second order temperature compensated bandgap voltage reference.

4,443,754

METHOD FOR DETERMINING MINIMUM LUBRICATING OIL-FILM THICKNESS UNDER OPERATING ENGINE CONDITIONS USING ELECTRICAL CAPACITANCE

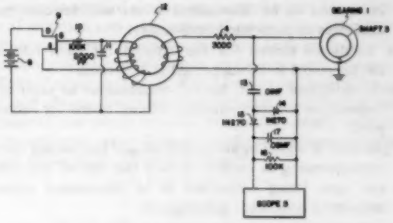
William H. King, Florham Park, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 18, 1982, Ser. No. 434,945
Int. Cl.³ G01R *27/26*
U.S. Cl. 324—61 R **9 Claims**

1. A method for determining the minimum oil-film thickness of a lubricating oil composition under operating engine conditions comprising:

(a) placing the lubricating oil composition being evaluated in an operating engine wherein a selected bearing of said engine is electrically isolated;

(b) obtaining an instantaneous signal relating to capacitance between the entire bearing and shaft and measuring the capacitance using capacitance measuring means, said capacitance measuring means employing a high enough frequency to avoid the ambiguous effect of oil conductivity and a low enough potential to avoid electrical discharge between the surfaces; and



(c) converting said capacitance signal developed between said bearing and shaft to a value indicative of the minimum oil-film thickness between said bearing and shaft at the particular time said capacitance signal is obtained by using the formula:

$$MOFT = s\left(1 - \sqrt{1 - \left(\frac{KA\epsilon}{sC}\right)^2}\right)$$

where:

is the radial clearance

K is a constant (0.08854)

A is the area of the plate

Σ is the dielectric constant of the material between the plates

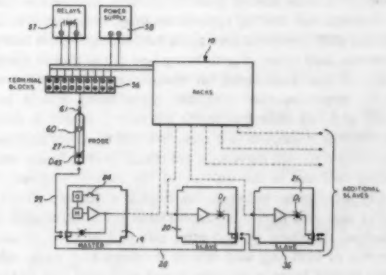
C is capacitance.

4,443,755

TEST APPARATUS FOR CIRCUIT BOARD RACKS

James F. Wooten, 3435 Walnut Bend #3116, Houston, Tex. 77042

Filed Dec. 7, 1981, Ser. No. 328,448
Int. Cl.³ G01R *19/00*
U.S. Cl. 324—66 **16 Claims**



1. A test apparatus for testing circuit connections in a printed circuit board rack which supports a plurality of separate circuit board modules, each of the boards having a plurality of points of connection to connectors at the rear of the supports for the respective boards, the connectors being interwired to provide connections from selected circuit components on one of the boards to selected circuit components on the same board and on other boards,

said apparatus comprising

a first circuit having connections to each of the connectors for the support for one of the circuit boards,

selector means for energizing said last named connectors individually,

a plurality of signal lights in said circuit, corresponding in number to said last named connectors, and each being connected to be illuminated when said selector means energizes its associated connector,

an additional circuit for the support for each additional circuit board to be supported in said rack,

each additional circuit having connections to each of the connectors for the respective circuit board for such support,

a plurality of signal lights in each of said last named circuits, corresponding in number to said last named connectors, and each being connected to be illuminated when its associated connector is energized.

4,443,756

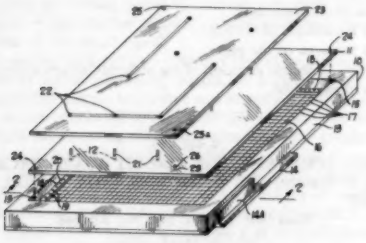
APPARATUS AND METHOD FOR TESTING CIRCUIT BOARDS

James D. Lightbody, and William S. Lightbody, both of 32600 Fairmount, Pepper Pike, Ohio 44124

Filed Nov. 26, 1980, Ser. No. 210,539

Int. Cl.³ G01R *15/12*

U.S. Cl. 324—73 PC **21 Claims**



1. A testing apparatus for use with a testing machine in testing circuit boards having a certain number of contacts laid out in a pattern, the testing apparatus comprising a universal series of electrically conductive pads, said series of pads being on a substrate, said series of pads being laid out in matrix form, the density of said pads being far greater than the density of electrically interconnected contacts, there being spaces between said pads, an interchangeable pin board, means to hold said pin board in respect to said substrate and to orient said pin board in respect to said pads, said pin board having holes, said holes being laid out in the pattern of the certain number of electrically interconnected contacts, double ended electrically conductive pins, said pins being expandable and contractable in a longitudinal direction of said pins, one end of each of said pins capable of bridging said spaces between said pads, said pins being in said holes in said pin board with said one end of each of said pins contacting a pad of said series of pads, means to electrically connect the pads being contacted by said one end of said pins, the active pads, with the testing machine, and means to orient the pattern of the contacts on the circuit board having the certain number of electrically interconnected contacts in respect to the pattern of said pinned holes of said pin board such that each contact on the circuit board is able to be contacted by a pin, respectively, when the circuit board is in testing position.

4,443,757

MULTIPLEXED ELECTRICAL SIGNAL PROCESSOR

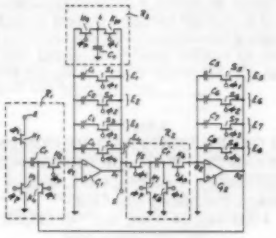
Ngoc C. Bui, Neuchatel, Switzerland, assignor to Asulab, S.A., Switzerland

Filed Sep. 24, 1981, Ser. No. 305,277

Claims priority, application Switzerland, Oct. 1, 1980, 7329/80

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 B **10 Claims**



1. An apparatus for processing a variable electrical signal by multiplexing with n processing channels, having a processing unit comprising a first amplifier; a plurality of charge-storing feedback components connected in parallel, the said charge-storing components consisting of n first processing elements each including a multiplexing switch and a charge-storing capacitor connected in series; a first charge-carrying component connected between the input of the said apparatus and the input of the said first amplifier, said first charge-carrying component including a single charge-transferring capacitor and at least two contact-breaking switches; means for providing the control signals including means for providing n periodic multiplexing signals each comprising an alternating succession of active and inactive levels, one of these multiplexing signals having a period shorter than that of the other multiplexing signals, the other signals of longer period having, taken as a whole, at most one active level between two consecutive active levels of the shorter period signal, and means for producing an alternation of the active levels of a switching signal occurring during the inactive levels of the other switching signal, each switching signal having an active level during each active level of the multiplexing signals, means for applying a multiplexing signal to each multiplexing switch; and means for applying switching signals to each contact breaking switch.

4,443,758

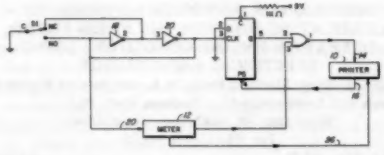
METER TO PRINTER COUPLING CIRCUIT

Charles A. P. Kelly, Barrington, N.J., assignor to Northern Telecom Inc., Nashville, Tenn.

Filed Apr. 10, 1981, Ser. No. 253,069

Int. Cl.³ G01R *13/04*

U.S. Cl. 324—113 **6 Claims**



1. An electronic device, comprising:

a printer having a data input to receive data to be printed, a print input for receiving a print command signal to initiate printing of received data, and a status output for providing a busy signal when said printer is printing;

a meter for sensing a variable to be measured and providing

a signal indicative of a value of said variable, said meter having a data output connected to said data input for supplying said data signal to said printer, said meter also having a hold input for receiving a hold signal to cause said meter to enter a stable state holding a sensed value of said variable, and a stable state output for providing a stable state signal in response to said stable state;

switch means for providing a control signal, said meter hold input being connected to said switch means for receiving said control signal as said hold signal;

bistable circuit means having an output and having inputs connected to said printer status output and said switch means for providing a first state output signal in response to said busy signal and providing a second state output signal in response to said control signal when said busy signal is not present; and

gating means having inputs connected to said bistable circuit means output and said meter print command output and having an output connected to said printer circuit input for providing said print command signal to said printer in response to said second state signal and said stable state signal.

4,443,759

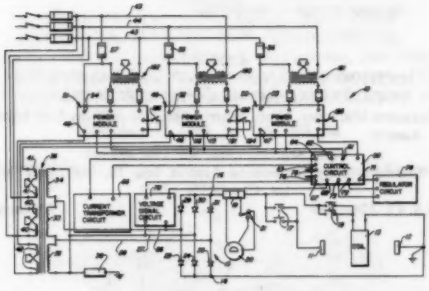
MAGNETIZING CURRENT SUPPLY FOR MAGNETIC PARTICLE INSPECTION WITH SCR'S CONNECTED TO THREE-PHASE SECONDARY WINDINGS FOR RECTIFICATION AND CONTROL

Bruce G. Isaacson, Park Ridge; Ralph W. Gruetzmacher, River Grove, and Kenneth W. Schroeder, Arlington Heights, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

Filed May 7, 1981, Ser. No. 261,498

Int. Cl.³ G01N *27/82*; H02P *13/24*; H02M *7/155*

U.S. Cl. 324—216 **12 Claims**



1. In a magnetic particle inspection system, magnetizing means for operation at high current and low voltage levels and arranged for association with a part to be inspected for applying a magnetizing field thereto, and a current supply for supplying a current of accurately controlled duration and magnitude to said magnetizing means to accurately control the duration and intensity of the magnetizing field applied to said part, said current supply comprising: first, second and third input lines for connection to a three-phase AC power supply, three-phase voltage step-down transformer means including first, second and third primary winding means and first, second and third secondary winding means, connection means arranged to provide substantially direct connections between said first, second and third input lines and said first, second and third primary winding means, first, second and third power modules respectively connected between said first, second and third secondary winding means and said magnetizing means, said first, second and third power modules respectively including first, second and third silicon-controlled rectifier means, each arranged for conducting a high level of current of one phase and of one polarity from the associated one of said secondary winding means and to said magnetizing means, first, second and third firing means for respectively controlling triggering of said first, second and third silicon-controlled rectifier means, first, second and third phase angle control means for respectively controlling the time of operation of said first, second and third firing means in each cycle, and a control circuit arranged to control said first, second and third firing means and said first, second and third phase angle control means to control the time of initiation and termination of current flow to said magnetizing means and to control the phase angle of firing of said silicon-controlled rectifier means, to thereby apply a magnetizing field of accurately controlled duration and intensity to said part, said silicon-controlled rectifier means and the associated circuitry of said power modules being substantially isolated by said transformer means from any voltage transients developed by said three-phase AC power supply.

4,443,760

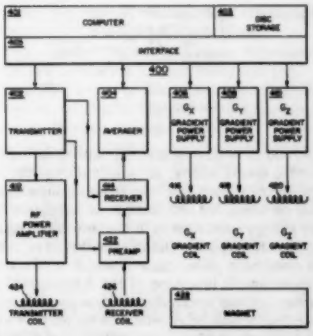
USE OF PHASE ALTERNATED RF PULSES TO ELIMINATE EFFECTS OF SPURIOUS FREE INDUCTION DECAY CAUSED BY IMPERFECT 180 DEGREE RF PULSES IN NMR IMAGING

William A. Edelstein, Schenectady, and Paul A. Bottomley, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,073

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **65 Claims**



1. A method for overcoming the effects of a spurious FID NMR signal so as to avoid interference thereof with the desired NMR spin echo signal, said method comprising sequentially the steps of:

a. maintaining a static magnetic field along a first axis of an NMR imaging sample;

b. selectively exciting, during a first predetermined time interval, a first plurality of nuclear spins in a planer section of said imaging sample by irradiating said imaging sample with a selective RF pulse in the presence of a first magnetic field gradient pulse;

c. applying for a second predetermined time interval at least one dephasing magnetic field gradient pulse along a second axis of said imaging sample to dephase said excited nuclear spins;

d. irradiating said imaging sample during a third time interval with a 180° RF pulse so as to initiate the rephasing of said excited nuclear spins, whereupon inherent imperfections in said 180° RF pulse cause a second plurality of nuclear spins in said imaging sample to change orientation by an angle other than 180° relative to the direction of said static magnetic field, said last-mentioned nuclear spins producing a net nuclear magnetization component transverse to the direction of said static magnetic field, which component produces a spurious FID NMR signal upon termination of said 180° RF pulse;

e. applying during a fourth predetermined time interval at least one imaging gradient having the same direction as said dephasing gradient such that a nuclear spin echo signal is produced by said rephasing of said excited nuclear spins;

f. sampling said spin echo in the presence of said imaging gradient; and

g. repeating steps (b–f) while shifting the phase of alternate ones of the selective RF pulses by 180° so as to produce a 180° shift in the corresponding spin echo signals such that, when alternate ones of said spin echo signals are subtracted, said spin echo signals reinforce while said spurious FID signals cancel.

4,443,761

NMR SPECTROSCOPY

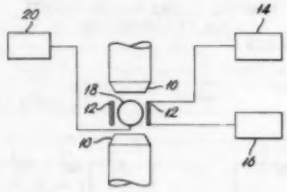
Malcolm H. Levitt, Hull, England, assignor to National Research Development Corporation, London, England

Filed May 27, 1982, Ser. No. 382,648

Claims priority, application United Kingdom, Jun. 16, 1981, 8119000

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—311 **6 Claims**



1. A method of heteronuclear decoupling in high resolution pulsed NMR spectroscopy, in which during the acquisition from a sample of signals resulting from resonance of a nuclear species to be observed the sample is irradiated with radio frequency energy substantially at the resonant frequency of an interfering nuclear species, the irradiation being in the form of a train of composite pulses each of which is effective to cause at least approximate inversion of the longitudinal magnetisation in respect of said interfering nuclear species, said composite pulses being of two types which differ only by virtue of the r.f. phase for one type being opposite that for the other type and said train being in the form of a repeated sequence which consists of two pulses of each type and which involves less than three changes of type between successive pulses.

4,443,762

METHOD AND APPARATUS FOR DETECTING THE DIRECTION AND DISTANCE TO A TARGET WELL CASING

Arthur F. Kuckes, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 12, 1981, Ser. No. 273,138

Int. Cl.³ G01V *3/08, 3/26*

U.S. Cl. 324—346 **15 Claims**

2. A well casing detector system for detecting the direction of and distance to a target well having a casing, comprising:

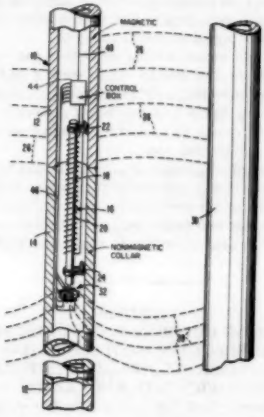
a housing having a magnetic portion and a nonmagnetic portion;

an elongated solenoid comprising a high permeability core and coil surrounding a major part of the length thereof;

means for energizing said solenoid coil to produce a source magnetic field axially symmetrical with respect to the axis of said solenoid;

means for securing said solenoid within and generally parallel to the axis of said housing, a first end of said solenoid being secured within said nonmagnetic portion of said housing and a second end of said solenoid being magnetically coupled to said magnetic portion of said housing for distribution of the magnetic pole corresponding to said second end, whereby said first end of said solenoid acts as a monopole magnetic field source;

a magnetometer mounted adjacent said first end of said solenoid; and



means for energizing said magnetometer to detect distortions in said magnetic field due to a target well casing, said magnetometer producing an output proportional to the vector components of said distorted field whereby the direction and distance of said target well casing from said detector system is measured.

4,443,763

METHOD AND AN APPARATUS FOR CHECKING POLAROGRAPHIC MEASURING ELECTRODES

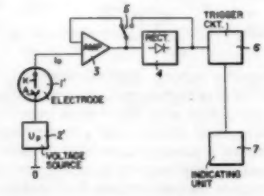
Hermann Marsoner, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Sep. 16, 1981, Ser. No. 302,786

Claims priority, application Austria, Sep. 18, 1980, 4678/80

Int. Cl.³ G01N *27/02*

U.S. Cl. 324—439 **8 Claims**

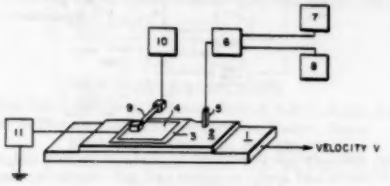


5. Apparatus for checking the condition of polarographic measuring electrodes by means of cyclical voltammetry, comprising an alternating voltage source, a current amplifier, and a measuring circuit including a trigger circuit, the anode of the measuring electrode to be checked is connected to one pole of said alternating voltage source for polarization, and the cathode of the measuring electrode is connected to said current amplifier, and wherein the output voltage delivered proportional to the electrode current by said current amplifier is applied to an input of said trigger circuit having at least one trigger level, and an output of said trigger circuit is connected to an indicating unit for effecting an indication corresponding to the highest exceeded trigger level.

4,443,764
METHOD FOR NON-DESTRUCTIVE DETECTION AND CHARACTERIZATION OF FLAWS

Nam P. Suh, Sudbury, and Ming K. Tse, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 30, 1980, Ser. No. 202,331
Int. Cl.³ G01N 27/60
U.S. Cl. 324—456 15 Claims

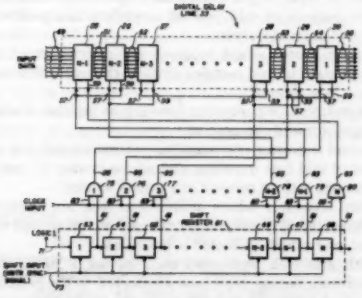


1. A method for the nondestructive testing and evaluation of an insulating material, said method comprising the steps of: applying an electrostatic charge pattern to one surface of the material; providing an electrode on a second surface opposite said one surface, said electrode being at an electrical potential lower than said one surface so that the electrostatic charge can decay through said material; allowing the charge pattern to decay for a predetermined period of time; and determining the residual charge pattern on said one surface after said period.

4,443,765
DIGITAL MULTI-TAPPED DELAY LINE WITH AUTOMATIC TIME-DOMAIN PROGRAMMING

Allen G. Findeisen, Austin; Larry L. Mellenbruch, Del Valle, and Wallace D. Lentz, Leander, all of Tex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1981, Ser. No. 303,448
Int. Cl.³ H03K 5/159, 5/14
U.S. Cl. 328—55 15 Claims

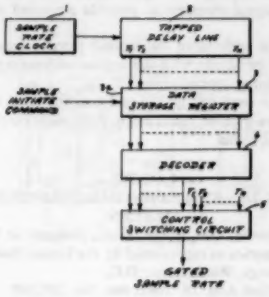


1. A variable delay line comprising:
a plurality of cascaded delay sections having a data input, each delay section including a first-in first-out register having a shift-in clock input and a shift-out clock input; and
means for programming fixed delay values simultaneously into said shift-in and shift-out clock inputs of alternate delay sections in response to irregularly spaced input signals.

4,443,766
PRECISION DIGITAL SAMPLER

John P. Belton, Jr., Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 694,129, Jun. 15, 1976, abandoned. This application Nov. 8, 1978, Ser. No. 958,920
Int. Cl.³ H03K 5/153, 5/159
U.S. Cl. 328—151 4 Claims

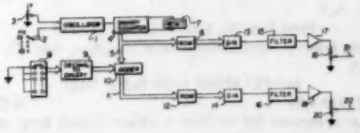


1. A precision digital sampler comprising
a sample rate clock,
a tapped delay line having multiple taps connected to receive a sample clock pulse train therefrom,
a data storage buffer register having a separate storage means for and connected to each delay line tap,
means for applying a sample initiate command signal to said buffer register, said buffer register storing the output state of each delay line tap in response thereto,
a decoder circuit connected to analyze the condition of said buffer register and detect the delay line tap at which the leading edge of the sample clock pulse is positioned, and
a control switching circuit receiving inputs from each tap of said tapped delay line and gating pulses out of said tapped delay line in response to the output of said decoder circuit.

4,443,767
VARIABLE PHASE LOCK CONTROL

James K. Reichert, Willowdale, and Michael A. Stott, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Feb. 23, 1981, Ser. No. 237,450
Claims priority, application Canada, Mar. 21, 1980, 348080
Int. Cl.³ H03K 3/78, 13/02; H03L 7/00, 708
U.S. Cl. 328—155 21 Claims



1. A variable phase lock control comprising:
(a) first storage means for digitally storing a representation of a first signal forming a substantially full cycle of a first predetermined waveform, the adresses of sequential elements of said first signal being sequential,
(b) means for generating a first address signal designating the addresses of said first signal elements and addressing the first storage means sequentially and cyclically to read out the stored first signal,

(c) second means for digitally storing a representation of a second signal forming a substantially full cycle of a second predetermined waveform, the addresses of sequential elements of said second signal being sequential, the number of elements of the first and second signals being similar,

(d) means for generating a digital signal having a value between zero and the number of elements of said first and second signals,

(e) means for adding said digital signal and the addresses of the first signal elements to provide a second address signal,

(f) means for addressing the second storage means sequentially and cyclically with the second address signal to read out the stored second signal,

whereby the read out first signal and the read out second signal have a phase relationship dependent on the value of the digital signal.

4,443,768

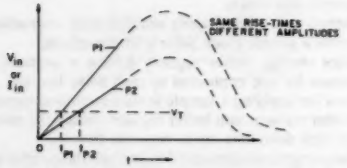
AMPLITUDE- AND RISE-TIME-COMPENSATED FILTERS

Charles H. Nowlin, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 28, 1981, Ser. No. 297,208

Int. Cl.³ H03K *6/00*

U.S. Cl. 328—167 **18 Claims**



1. An amplitude-compensated, rise-time-compensated filter for converting an input pulse, having a substantially linear leading edge, to a bipolar output pulse, the filter comprising,

differentiator means for differentiating the input pulse; and

subtractor means for subtracting a pulse directly proportional to the input pulse from the differentiated input pulse, to form an output pulse having a fixed zero crossing time relative to the time of occurance of the input pulse that is invariant with the amplitude or rise time of the input pulse.

4,443,769

FREQUENCY SEARCH SYSTEM FOR A PHASE LOCKED LOOP

Felix Aschwanden, Thalwil, and Willem H. Groeneweg, Affoltern, both of Switzerland, assignors to RCA Corporation, New York, N.Y.

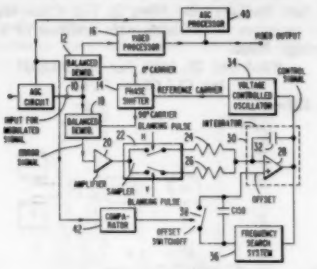
Filed Sep. 21, 1981, Ser. No. 304,163

Claims priority, application United Kingdom, Apr. 27, 1981, 8112914

Int. Cl.³ H03D *3/18*; H03L *7/00*

U.S. Cl. 329—50 **6 Claims**

1. An apparatus for locking a phase locked loop onto a modulated reference signal, said apparatus comprising deriving means for deriving from said reference signal a demodulated signal and an error signal; sampling means for sampling said error signal, avoiding means for avoiding lock ups of said loop on other than said reference signal, integrating means for integrating the sampled signal, said avoiding means comprising applying means for applying an offset signal to said integrating means, said applying means comprising ceasing means for ceasing to apply said offset signal once locking is achieved, said ceasing means comprising an automatic gain control processor coupled to said deriving means to receive said demodulated signal, a comparator having a pair of inputs respectively coupled to said processor and to a comparator reference signal



source, and a switch controlled by said comparator and coupled between said applying means and said integrating means.

4,443,770

AUTOMATIC LEVEL CONTROL CIRCUIT

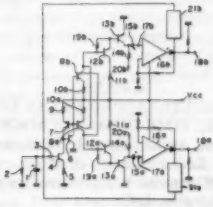
Manabu Itobayashi, and Hisao Ohtawa, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,873

Claims priority, application Japan, Jun. 27, 1980, 55-88319

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—284 **4 Claims**



1. An automatic level control circuit which comprises:

a pair of amplifiers;

a pair of rectifying circuits each respectively connected to the outputs of said pair of amplifiers and producing a direct current output;

a first transistor whcih receives said direct current output from each of said rectifier circuits, through a first resistor to a base thereof;

a second resistor connected between an emitter of said first transistor and the ground;

a second transistor whose collector is connected to a collector of said first transistor and whose emitter is connected through a third resistor to a power source;

a third transistor whose emitter and base are respectively connected to the base and collector of said second transistor, and whose collector is grounded;

fourth and fifth transistors each having a multicollector sturcture having each base connected to the base of said second transistor and wherein said fourth transistor has one of its collectors connected to one of the collectors of said fifth transistor;

fourth and fifth resistors connected between emitters of said fourth and fifth transistors and said power source;

sixth and seventh transistors whose bases are respectively each connected to one of the collectors of said fourth and fifth transistors;

sixth and seventh resistors which are respectively connected between said power source and each of the collectors of sixth and seventh transistors;

eighth and ninth resistors which are respectively connected between each base and emitter of said sixth and seventh transistors;

eighth and ninth transistors whose bases are respectively connected to each of the emitters of said sixth and seventh transistors, and whose emitter are grounded; and

a pair of input resistors with each of said input resistors connected to each of the collectors of said eighth and ninth transistors to attain automatic leveling operation by utilizing the saturated resistances of said eighth and ninth transistors.

4,443,771

POWER AMPLIFIER

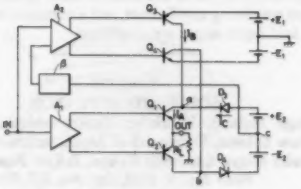
Satoshi Ishii, and Hirosi Koinuma, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,100

Claims priority, application Japan, Dec. 11, 1980, 55-177954

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—297 **22 Claims**



1. A power amplifier, comprising:

a class A amplifier portion having at least first and second transistors of opposite conductivity types having their emitter-collector paths connected in series, the common connection point of said first and second transistors comprising an output;

a first DC source means having first and second terminals connected across said series connection of said first and second transistors;

diodes coupled between said first DC source means and either end of said series connection of said first and second transistors;

second DC source means; and

a class B amplifier portion having at least third and fourth transistors of opposite conductivity types, said first and third transistors being connected in series between said second DC source means and said output, and said second and fourth transistors being connected in series between said second DC source means and said output, wherein said class B amplifier portion is used by said class A amplifier portion as a current source.

4,443,772

SWITCHING MICROWAVE INTEGRATED BRIDGE T GROUP DELAY EQUALIZER

Alfred Schwarzmann, Mount Laurel, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,338

Int. Cl.³ H01P *1/20*

U.S. Cl. 333—28 R **7 Claims**

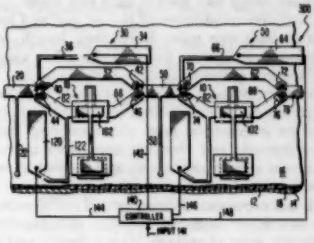
1. A group delay equalizer for compensating for increasing group delay for increasing frequency over a given band of microwave frequencies above one Gigahertz comprising:

first and second strip conductors spaced end to end from each other and on one surface of a dielectric substrate having a ground conductor on the opposite surface of said substrate to form two transmission lines;

a third, relatively narrow, strip conductor forming an inductor at said given band of frequencies and connecting said first and second conductors to provide a series inductive coupling between them;

a dielectric body overlying adjacent end portions of said first and said second conductors;

a fourth strip conductor overlying said dielectric material, at least a part of said first conductor and at least a part of said second conductor, and of a width to form a series of first and second capacitors between said two transmission lines;



a grounded capacitor connected to said fourth conductor and therefore at the junction of said first and second capacitors by a fifth, relatively narrow, strip conductor forming an inductor at said given band of frequencies which provides inductive coupling between said fourth conductor and said grounded capacitor; and

said third and fifth conductor effective lengths and widths being selected together with the values of said first, second, and grounded capacitors to produce a compensating decrease in group delay for increasing frequency.

4,443,773

SWITCHING NETWORK FOR MEGAHERTZ FREQUENCY SIGNALS

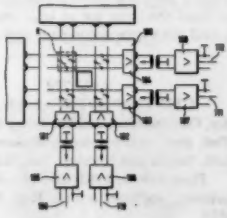
Bernhard Rall, Ulm; Johann Burkhart, Senden, and Klaus Schlüter, Ulm-Gögglingen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,521

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1981, 3101932

Int. Cl.³ H01P *1/15;* H04Q *3/00*

U.S. Cl. 333—104 **8 Claims**



1. In a switching network in matrix form for megahertz frequency signals, including:

a multilayer printed circuit board having a plurality of row signal lines located in a first plane, a plurality of column signal lines located in a second plane and extending transverse to the row lines, the row and column signal lines intersecting one another in an intersection area, control and/or shielding conductors surrounding the lines, and metal shields enclosing the planes; at least one crosspoint array module integrated on a chip and providing circuit means defining a plurality of crosspoints for the intersec-

tion area, each crosspoint presenting two semiconductor switches arranged to couple a respective column signal line to a respective row signal line; and a shielded package enclosing the module,

the improvement wherein:

each said line is constituted by a balanced pair of stripline conductors terminated at each end of said line by the characteristic impedance of said line;

there are two of said control or shielding conductors between every two lines in each said plane;

said stripline conductors of at least one said line are twisted at at least one point along their length, with one said stripline conductor crossing the other via a portion located in a plane other than that of said one line;

said circuit board further comprises, in each said plane: two current supply conductors associated with the conductors of an intersection area and bordering their associated conductors; and blocking capacitors connected to said current supply conductors and located in regions of said board which are free of conductors;

each said crosspoint defined by said circuit means comprises: a switchable balanced amplifier; an input circuit connecting the input of said amplifier to one of said lines which is coupled by said crosspoint, and having a high input resistance relative to the characteristic impedance of that said line to which it is connected; and an output circuit connecting the output of said amplifier to the other one of said lines which is coupled by said crosspoint, and having a high output resistance relative to the characteristic impedance of that said line to which it is connected;

each said amplifier comprises: two active transistors connected to one another in a manner which is balanced to ground and each controllable between a conductive, essentially linearly amplifying state and a blocking state; and two further transistors of the same conductivity type as said active transistors and connected to one another in a manner which is balanced to ground and to be permanently in a blocking state to serve as compensation elements, each said further transistor having its emitter connected to the emitter of a respective active transistor and its collector connected to the collector of the other said active transistor, whereby said further transistors compensate the residual crosstalk of said active transistors when in their blocked state;

said circuit board further comprises socket elements for connecting said module to said lines in its associated intersection area;

said shielded package comprises plug connector pins and signal leads connected to said chip for coupling said module to said socket elements; and

said switching network further comprises means providing electric field shielding for at least one of said socket elements, said plug connector pins, and said signal leads.

4,443,774

CTD TRANSVERSAL FILTER

Rainer Lüder, Oberhaching, and Wolfgang Haussmann, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

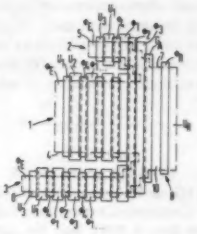
Filed Feb. 2, 1982, Ser. No. 344,925

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104521

Int. Cl.³ H03H *15/02*

U.S. Cl. 333—165 **5 Claims**

1. CTD transversal filter, for time delayed forming of a given input signal being weighted and subsequently summed for producing a filter characteristic, with weighting coefficients optionally having a negative and a positive sign, comprising a separate input stage for forming each desired weighting coefficient for obtaining a desired filter characteristic, said input signal being scanned by a common scanning frequency for all input stages, being converted to a charge packet proportional to its voltage and being time delayed in said input stages, first gate electrodes connected to said input stages forming the positive weighting coefficients, second gate electrodes connected to said input stages forming the negative weighting coefficients in an inverting manner as compared to said positive weighting coefficients, said first and second gate electrodes having surface areas under which said charge packets are formed proportional to the input voltage, said surface areas corresponding in size to the ratio of the absolute values of the required weighting coefficients, and a common output stage in which said input stages are combined.



4,443,775

SOLENOID ACTUATOR

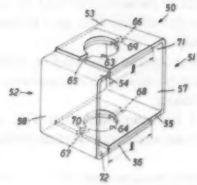
Hidetsugu Fujitani, Kasukabe; Tsuneo Ishigaki, Sugito, and Tetsuro Tokuda, Misato, all of Japan, assignors to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

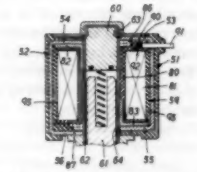
Filed Jan. 6, 1982, Ser. No. 337,501

Claims priority, application Japan, Jan. 31, 1981, 56-13009[U]; Oct. 6, 1981, 56-148431[U]

Int. Cl.³ H01F *3/00*

U.S. Cl. 335—281 **5 Claims**





1. A solenoid actuator comprising:

a coil formed by applying windings around a bobbin including top and bottom end plates;

a magnetic frame comprising a pair of magnetic frame parts each fabricated from a ferromagnetic sheet material by bending the both ends thereof so as to define a top plate and a bottom plate integrally connected to the both ends of a side plate respectively for covering the top, bottom and side of the coil, said top and bottom plates of said magnetic frame parts each defining a leading edge opposite the integral connection thereof to the respective side plate;

said pair of magnetic frame parts assembled with their top plates and the bottom plates being overlapped to each

other, with the overlap between said top plates and between said bottom plates selected to afford a sufficient magnetic flux path and to form a gap for containing connection portions of lead wires for making electrical connection to said windings, said gap formed between the leading edge of a selected one of the top and bottom plates of one of said frame parts and the side plate of the other frame part; and

said bobbin further comprising a stepped portion on a selected of the end plates thereof to define a partition chamber, said stepped portion disposed in said gap, said partition chamber adapted to contain said connection portions between said lead wires and said windings to isolate said lead wires from said windings except for said connection portions.

4,443,776

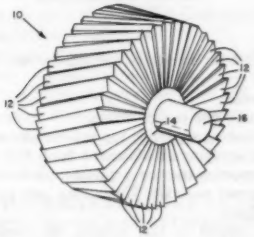
ROTARY MAGNET DEVICE

David J. Cunningham, 2508 Barnhart, Fort Wayne, Ind. 46805

Filed Aug. 10, 1983, Ser. No. 522,339

Int. Cl.³ H01F *7/02*

U.S. Cl. 335—302 **14 Claims**



1. A magnet device, comprising:

a first substantially circular array of magnetized elements, each said magnetized element having opposite surfaces of opposite polarity and being disposed in surface-to-surface facing relationship with adjacent ones of said magnetized elements such that each said surface of each said magnetized element is in facing relationship with a respective said surface of opposite polarity of an adjacent said magnetized element, said magnetized elements being angularly disposed about respective radial axes relative to the plane of said first array to expose first portions of said surfaces of like polarity to one side of said plane and second portions of polarity opposite to said first portions on the other side of said plane, thereby creating about said first array a magnetic field having substantially uniform polarity, substantially uniform field strength, and substantially uniformly, angularly oriented magnetic field force vectors, and

a second substantially circular array of other said magnetized elements being substantially coaxially disposed relative to said first array, each said other magnetized element having opposite surfaces of opposite polarity and being disposed in surface-to-surface facing relationship with adjacent ones of said other magnetized elements such that each said surface of each said other magnetized element is in facing relationship with a respective said surface of opposite polarity of adjacent said other magnetized element, said other magnetized elements being angularly disposed about respective radial axes relative to the plane of said second array to expose first portions of said surfaces of like polarity to one side of said plane and second portions of polarity opposite to said first portions on the other side of said plane, thereby creating about said second array a magnetic field having substantially uniform polarity, substantially uniform field strength, and substantially uniformly angularly oriented magnetic field force vectors,

one of said first array and said second array being rotatable relative to the other of said first array and said second array when portions of their respective said magnetic fields interact with each other.

4,443,777

MINIATURE TRANSFORMER

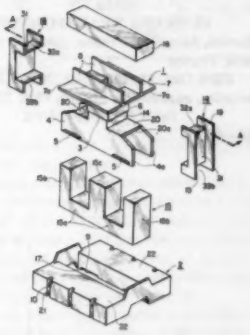
Tsutomu Koike, Higashi-Murayama, Japan, assignor to Toku Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,440

Claims priority, application Japan, Oct. 15, 1980, 55-146576[U]; Oct. 15, 1980, 55-146577[U]

Int. Cl.³ H01F *15/02, 27/30*

U.S. Cl. 336—65 **4 Claims**



1. A miniature transformer comprising an insulative bobbin having a pair of flanges and a center portion around which an insulated tape wire is wound in layers, at least a part of said center portion being stepped in a direction parallel to the longitudinal axis of said bobbin to accommodate, in the stepped portion, a lead wire connected to the innermost layer of said tape wire.

4,443,778

ADAPTER FOR A LOW-VOLTAGE LAMP

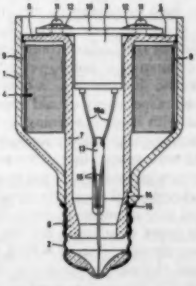
Jan A. C. Mewissen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,736

Claims priority, application Netherlands, Jul. 29, 1981, 8103571

Int. Cl.³ H01F *27/02*

U.S. Cl. 336—90 **9 Claims**



1. An adaptor for a low-voltage lamp comprising a housing having at one end a lamp cap for connecting the adaptor to a

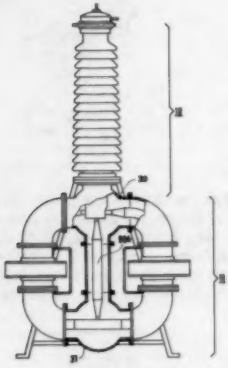
line voltage lamp holder, and also comprising a lamp holder for a low-voltage lamp, in which housing a transformer is incorporated, the primary of which is connected to the lamp cap by current conductors and the secondary of which is connected to the lamp holder by current conductors, characterized in that the transformer is a ring core transformer and that an assembly member is provided which has a tubular part and an integral flange at one end, which assembly member carries the lamp holder and is partly contained in the housing, the tubular part of which assembly member is surrounded by the transformer and at its end remote from the flange projects through an aperture in the housing and is there secured to the lamp cap, the flange of the assembly member bearing against the housing in the longitudinal direction of the tubular part so that the housing is retained in position by the lamp cap and the flange.

4,443,779

CURRENT TRANSFORMER

Edmond Thuries, Meyzieu, France, assignor to Alsthom-Atlantique, Paris, France

Filed Oct. 21, 1981, Ser. No. 313,401
Claims priority, application France, Oct. 22, 1980, 80 22552
Int. Cl.³ H01F *27/04*
U.S. Cl. 336—92 **3 Claims**



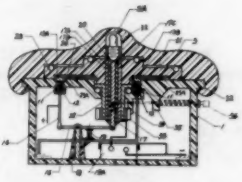
1. A current transformer with an insulating through bushing and an underlying annular metal chamber, said metal chamber having an upper portion and a lower portion, both said through bushing and said chamber being filled with compressed gas, a primary circuit with an input conductor which enters the metal chamber upper portion via the through bushing and an output conductor which leaves the metal chamber upper portion via the through bushing coaxially to the first conductor, and at least two magnetic circuits surrounding said metal chamber, each magnetic circuit having a secondary winding, and wherein the current transformer has an electric side connection emanating at said lower portion of said metal chamber, said electric side connection comprising a tube having ends connected respectively to said upper and lower metal chamber portions with its ends opening to the interior of said annular metal chamber, and a side connection conductor positioned within said tube, spaced therefrom and extending coaxially thereof to form with said tube, a gas insulated side connection cable, and wherein said magnetic circuits are disposed on either side of said side connection, such the current initially entering via said input conductor divides within said metal chamber into two circuits, one of which exits through said conductor via said through bushing and the other of which exits through said side connection conductor and wherein said side connection conductor is disposed in the insulating through bushing coaxially to the input conductor and the output conductor of the primary circuit such that the transformer functions as a double transformer, saving one insulating through bushing, and wherein the current as measured by the two secondary windings is sufficient to determine the current flowing through said input, said output and said side connection conductors.

4,443,780

FUSE SWITCH WITH PLURAL POSITIONABLE FUSE ELEMENTS

Hsu Huai-Chieh, No. 44, La. 53, Ku Shan 1st Rd., Kaohsiung, Taiwan

Filed Apr. 8, 1980, Ser. No. 138,443
Int. Cl.³ H01H *85/22, 85/32*
U.S. Cl. 337—257 **5 Claims**



1. A fuse switch for an electric circuit, the fuse switch comprising:

a power source;

a load driven by said power source;

a housing including separable top and bottom sections, said top section carrying an indication lamp and said bottom section supporting thereon a rotatable platform carrying a primary circuit normally connecting said power source with said load;

a secondary circuit in said housing for connecting said power source with said lamp;

first switching means in said primary circuit comprising a fuse element having fusible portions, at least one of said portions being disposed in said primary circuit for completing said primary circuit, said first switching means defining means for connecting said power source to said secondary circuit when said at least one portion fuses thereby disconnecting said power source from said primary circuit; and

means for repositioning said first switching means while in said primary circuit, said repositioning means being cooperable with said platform to reconnect said power source with said primary circuit by disposing another of said fusible portions in said primary circuit thereby disconnecting said power source from said secondary circuit after said at least one portion has fused and said first switching means is repositioned, said repositioning means including means for mechanically driving said platform, the latter carrying said first switching means and being rotatable in response to actuation of said driving means.

4,443,781

GAS DETECTING SENSOR

Minoru Ohta; Yutaka Hattori, both of Okazaki; Tomio Kawakami, Nishio, and Michitosi Onoda, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Dec. 31, 1981, Ser. No. 336,401
Claims priority, application Japan, Apr. 27, 1981, 56-63626
Int. Cl.³ H01L *7/00*
U.S. Cl. 338—34 **10 Claims**

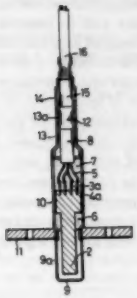
1. A gas detecting sensor for detecting the partial pressure of oxygen gas contained in exhaust gases, comprising:

a base member made of ceramic material containing alumina as a main ingredient;

a pair of electrodes held by said base member;

a sensing element held by and fixed to said base member and

electrically connected to said pair of electrodes; and sensing element having an electrical characteristic responsive to the partial pressure of oxygen gas, said sensing element being made of ceramic material selected from the group consisting of cobalt monoxide, nickel monoxide and



perovskite-type double oxide which contains at least one of lanthanum and cobalt; and

an intermediate layer of ceramic material which is substantially non-reactive with said sensing element, said intermediate layer being disposed between and separating said base member from said sensing element.

4,443,782

METHOD FOR REGULATING THE VALUE OF A THICK FILM RESISTOR AND A CORRESPONDING RESISTOR

Emmanuel J. Poirier d'Ange d'Orsay, Castanet, France, assignor to S.E.V. Societe pour l'Equipement de Vehicules, Issy-les-Moulineaux, France

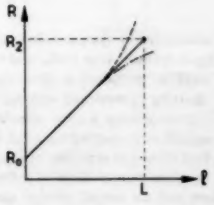
PCT No. PCT/FR81/00080, 371 Date Feb. 18, 1982, 102(e) Date Feb. 18, 1982, PCT Pub. No. WO81/03714, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 18, 1981, Ser. No. 355,563

Claims priority, application France, Jun. 19, 1980, 80 13643

Int. Cl.³ H01C *10/00*

U.S. Cl. 338—195 **16 Claims**



1. A thick film resistor, comprising resistive film disposed on an insulating support, said resistive film having edge regions, a first connection terminal on an edge region of the film, a second connection terminal spaced from the first terminal and on an edge region of the film, a conductive connection bar spaced from said terminals and on another edge region of the film, and a slot (23,33) formed in said film between said connection terminals (21, 22, 31, 32), said slot having a median line which is perpendicular to a median line of the connection bar (24, 34), and said connection bar electrically connecting the portions of the edge region of the resistive film which lie on opposite sides of the median line of the slot so that said connection bar forms a part of the current path between the portions of the resistive film on opposite sides of the median line of the slot.

4,443,783

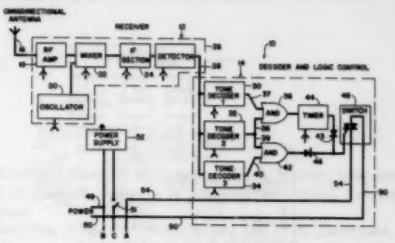
TRAFFIC LIGHT CONTROL FOR EMERGENCY VEHICLES

Wilbur L. Mitchell, 2011 E. 43rd St., Anderson, Ind. 46013

Continuation-in-part of Ser. No. 238,044, Feb. 25, 1981, which is a continuation-in-part of Ser. No. 6,351, Jan. 25, 1979, abandoned. This application Apr. 1, 1983, Ser. No. 481,454

Int. Cl.³ G08G *1/07*

U.S. Cl. 340—32 **7 Claims**



1. Apparatus for control of traffic lights for passage of an emergency vehicle, comprising:

(a) a conventional traffic light controller (TLC),

(b) first means for removing power from said TLC to leads leading to all of the traffic lights under control of said TLC; during at least a first selected time interval;

(c) second means for applying power to selected ones, but not all, of said leads leading to said traffic lights during at least part of said selected time interval;

(d) a directional antenna and radio transmitter connected thereto mounted in an emergency vehicle so as to transmit radiation in the direction in which said vehicle is moving;

(e) an omni-directional antenna and radio receiver means connected thereto mounted at an intersection, for receiving radiation from all directions;

(f) said first and second means responsive to a signal received by said radio receiver means; and in which

(g) said radiation transmitted to said receiver means includes at least three tons of different selected frequencies, which are operated as two groups, only one group of which operates at any selected time; one of said two groups comprising a first pair of tones being transmitted alternatey on an on/off cycling; the second group comprising a second pair of tones; of which at least one tone is different from both of said first pair of tones; said second pair being transmitted simultaneously and continuously; and in which

(h) said radio receiver means includes means responsive to both of said at least first pair of tones, and to their on/off cycling to control a timer means to close a selected electrical circuit through said timer means for a second selected time interval; and also includes means responsive to both said at least second pair of tones, and to their continuous nature, to by-pass said timer means, and to close said selected electrical circuit directly.

4,443,784

FAULT DETECTION IN ELECTRONIC VEHICLE CONTROLS

Horst Franzen, Hemhofen, and Wolfgang Rothmeier, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 161,281, Jun. 19, 1980. This application May 17, 1982, Ser. No. 379,376

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926132

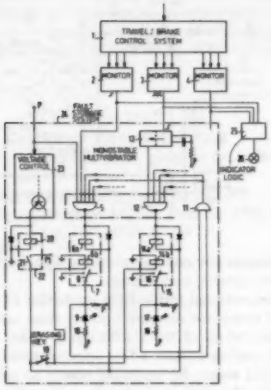
Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 F **3 Claims**

1. An arrangement in a vehicle for detecting fault conditions

which occur in electronic vehicle controls, the arrangement being of the type which uses at least a first output signal from a first monitoring device and a subsequent output signal, each such output signal being responsive to a fault condition, the arrangement further comprising:

first storage means including at least one bistable relay having a plurality of stable states, and which transfer from a first to a second stable state in response to the first output signal of the first monitoring device, the first storage means further having means for preserving the state of the



bistable relay after the vehicle has been shut down and an energizing potential for the arrangement has been discontinued;

blocking means responsive to the second stable state of the first storage means for preventing changes in the state of the first storage means in response to the first output signal of the first monitoring device and the subsequent output signal; and,

voltage control means for deenergizing the first storage means when a supply voltage at the first storage means falls below a predetermined voltage level.

4,443,785

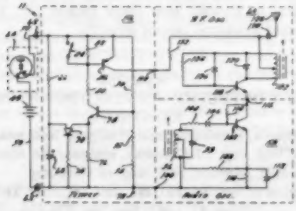
LOW POWER PUT TIMER CIRCUIT AND THE APPLICATION THEREOF WITHIN A TIRE PRESSURE MONITOR

Donald Speranza, Canton, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 112,368, Jan. 15, 1980, abandoned. This application Aug. 12, 1981, Ser. No. 292,112

Int. Cl.³ B60C *23/00*

U.S. Cl. 340—58 **9 Claims**



1. A tire pressure monitoring system comprising:

transmitter means operative to monitor fluid pressure within a pneumatic tire and generate a succession of tire inflation condition signals when said pressure falls within a predetermined operating range, said transmitter comprising an electronic timer including a programmable unijunction transistor biased to periodically shift between a conductive state and a non-conductive state to establish the period of said signals, said timer comprising,

(A) means operative to define a first current path having a characteristic impedance which establishes the peak voltage for said timer and to impress an electrical potential upon the gate input of said transistor, and

(B) means operative to define a second current path having a second characteristic impedance selectively connected to the gate input of said transistor in the conductive state to provide substantially all of the current flowing therethrough, said second impedance operative to limit the valley current of said timer; and

means operative to receive and count said tire condition signals and to generate an operator alerting signal when less than a predetermined number of said tire condition signals are received during a preestablished increment of time.

4,443,786

DATA TRANSMISSION SYSTEM EMPLOYING WIRE AND WIRELESS TRANSMISSION PATHS

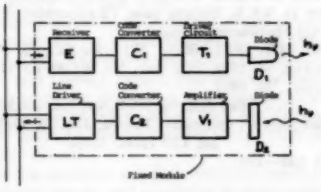
Heinz Hämmerling, Königstein, and Werner Schairer, Weinsberg, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,335

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1980, 3035965

Int. Cl.³ H04B *3/54*

U.S. Cl. 340—310 R **14 Claims**



14. A data transmission system using an alternating mains supply for a signal transmission path, said system comprising:

a movable module including a data input device, a first infra-red emitting component coupled to said data input device for transmitting a first wireless transmission of infra-red signals representing data fed into said data input device, a first infra-red sensitive component for receiving a second wireless transmission of infra-red signals representing data and an output device coupled to said first infra-red radiation sensitive component for putting out data corresponding to the received second wireless transmission; and

a fixed module arranged to be connected to the mains supply and including a second infra-red sensitive component for receiving the first wireless transmission, means coupled to said second infra-red sensitive component for feeding data into the mains supply corresponding to the data received by said second infra-red sensitive component, signal receiver means for receiving data from the mains supply and a second infra-red emitting component coupled to said signal receiver means for transmitting a second wireless transmission of infra-red signals representing data corresponding to the data received by a said signal receiver means.

4,443,787
APPARATUS FOR MEASURING THE ANGULAR POSITION OF A SHAFT

Heimo Denk, Feldbach, and Peter Mantsch, Graz, both of Austria, assignors to Hans List, Graz, Austria

Continuation of Ser. No. 117,002, Jan. 30, 1980, abandoned. This application Mar. 9, 1982, Ser. No. 356,478

Int. Cl.³ H03K *13/02, 13/20*

U.S. Cl. 340—347 P **13 Claims**

1. Apparatus for measuring the angular position of a rotating machine element relative to a reference position thereof, comprising:

a recognition circuit responsive to an input signal containing a signal component responsive to an event originated by the operation of the machine and noise and providing first output signals upon the occurrence of said event;

a first threshold sensing circuit responsive to said input signal and having a first threshold level less than the level of said given event and the level of said noise and providing second output signals with said input signal exceeding said threshold level; and

an evaluation circuit for generating a signal representative of the angle of rotation of said rotating machine element between said reference position and the occurrence of said event in response to said first and second output signals, and including means for receiving counting signals representative of movement of said rotating machine element, and being triggered by said second signals, and said apparatus further comprising reset means providing a reset signal to said means for receiving counting signals with the level of said input signals less than said first threshold level, said evaluation circuit further including a bistable device set by said first signal to deliver a substantially continuous enabling signal to said counting means and being reset by a signal representative of said reference position, and storage means for storing the output of said means for receiving counting signals after said reference position is reached.

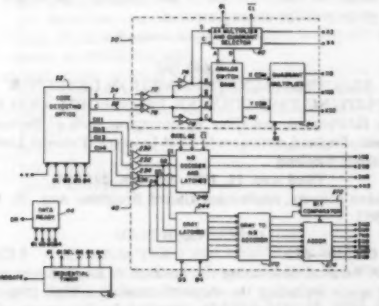
4,443,788
OPTICAL ENCODER SYSTEM

Donald H. Breslow, Framingham, Mass., assignor to Itek Corporation, Lexington, Mass.

Division of Ser. No. 173,219, Jul. 28, 1980. This application Aug. 27, 1982, Ser. No. 412,312

Int. Cl.³ G08C *9/06*

U.S. Cl. 340—347 P **5 Claims**



1. An optical angular encoder system including a code disc having a fine code track thereon, illuminating means for illuminating the code track, detecting means for detecting the illumination which passes through the code track and for providing sinusoidal detector outputs as a function of the angular position of the code disc, and multiplier circuitry for providing a multibit digital output from the sinusoidal outputs by deriving a family of phase shifted sinusoids in parallel circuits, converting the family of sinusoids to squarewaves and logically combining the squarewaves from parallel circuits, the system characterized by:

the multiplier circuitry being designed to provide a multibit digital output directly from the sinusoidal detector outputs only through one of a plurality of segments of the fine track cycle; and

circuitry for selectively modifying the sinusoidal inputs to the multiplier circuitry such that those inputs are identical through each of said segments of the fine track cycle.

4,443,789
KEYBOARD

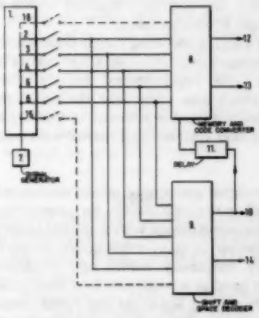
Cyril Endfield, London, and Christopher J. Rainey, Croydon, both of England, assignors to Microwriter Limited, London, England

Continuation of Ser. No. 973,628, Dec. 27, 1978, abandoned, which is a continuation of Ser. No. 743,291, Nov. 18, 1976, abandoned, which is a continuation of Ser. No. 542,055, Jan. 17, 1975, abandoned. This application Nov. 13, 1981, Ser. No. 320,925

Claims priority, application United Kingdom, Jan. 22, 1974, 2915/74

Int. Cl.³ G06F *3/02*

U.S. Cl. 340—365 R **20 Claims**



1. A keyboard operated signal producing apparatus comprising an input keyboard having a set of five manually operable finger keys arranged for operation with only one hand, and each of said keys being arranged for operation with a different finger of said one hand, said keys being selectively operable to provide a different pre-selected combination of operated and non-operated ones of said keys for each alphabetic character in an alphabetic system having a total number of characters greatly exceeding the number of said keys, means responsive to operation of selected ones of said keys for producing a unique coded electrical output for each of the different combinations of operated and non-operated ones of said keys, whereby each unique coded output represents a different character in said system, there being a unique pre-selected combination of said keys assigned for operation to represent each character in a majority of the characters making up said system to thereby provide a group of unique key combinations in which each unique key combination of the group represents a different character in said majority of characters, the arrangement of said keys being pre-selected to provide a pictographic relationship between each key combination in a majority of said unique combinations and the alphabetic character represented thereby.

4,443,790

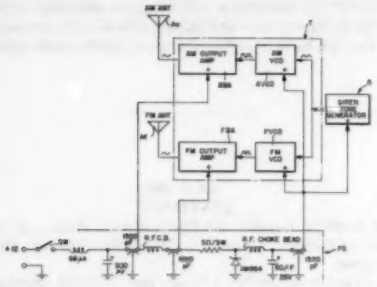
BROADCAST BAND SIREN ALARM TRANSMITTER SYSTEM FOR VEHICLES

Frank A. Bishop, 6489 Claudia Dr., Brookpark, Ohio 44142

Filed May 29, 1979, Ser. No. 43,329

Int. Cl.³ G08B *1/08;* G08G *1/00*

U.S. Cl. 340—539 24 Claims



1. A warning alarm device capable of generating an audibly detectable warning signal in radio receivers which are within a predetermined transmission range and which are tuned to any frequency within a predetermined radio broadcast band, said warning alarm device including:

(a) a transmitting means for transmitting a carrier signal to any radio receiver operating within the transmission range and tuned to any discrete frequency within said predetermined radio broadcast band;

(b) a carrier signal generating means connected to said transmitting means for generating a RF carrier signal having no audio signal superimposed thereon at a discrete frequency which may vary over the entire predetermined radio broadcast band in response to a sweep signal and for supplying said transmitting means with said RF carrier signal;

and

(c) a sweep signal generating means connected to said carrier signal generating means for supplying said carrier signal generating means with a sweep signal which causes said RF carrier signal to continuously sweep through each and every frequency within said predetermined radio broadcast band at a predetermined audio rate to generate an audible waring signal on any radio receiver which is within the transmission range and which is tuned to any distinct frequency within the broadcast band by the creation of only a single acoustical output pulse from the radio receiver each time said RF carrier signal passes through the discrete frequency to which the radio receiver is tuned, said acoustical output pulses forming the audible warning signal and occuring at a frequency proportional to said predetermined audio rate,

whereby the warning alarm device provides radio receiver listeners with an audible warning of the proximity of said warning alarm device.

4,443,791

SELF-COMPENSATING GAS DETECTION APPARATUS

Ojars Risgin, deceased, late of Grass Lake, Mich., and by Geraldine J. Risgin, administratrix, 4800 W. Ellsworth Rd., Ann Arbor, Mich. 48103

Filed Jan. 5, 1978, Ser. No. 867,071

Int. Cl.³ G08B *17/10*

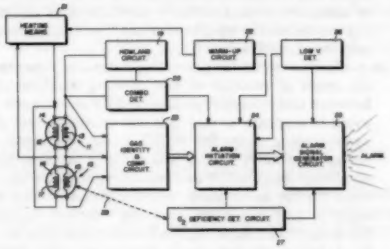
U.S. Cl. 340—634 20 Claims

1. Apparatus for detecting and indicating the presence of at least a predetermined minimum concentration of at least one undesirable gas within a given area comprising:

a first semiconductor gas-sensing means having at least one electrical property which changes significantly in response to the presence of said at least a predetermined minimum concentration of said at least one undesirable gas, said electrical property tending to vary with changes in at least one of conditions such as temperature, relative humidity and drift;

a second semiconductor gas-sensing means having a similar electrical property which changes significantly in response to the presence of a different gas but changes less significantly in response to the presence of said at least one undesirable gas, said similar electrical property also tending to vary with changes in at least one of said conditions such as temperature, relative humidity and drift;

electrical circuit means responsive to said electrical property of said first and second semiconductor gas-sensing means for generating at least one reliable electrical output signal compensated for variations in such changes as temperature, relative humidity and drift, said error-compensated



electrical output signal being generally indicative of the relative concentration of said at least one undesirable gas, at least in the absence of significant concentrations of said different gas;

means for establishing at least one predetermined threshold range indicative of less than said predetermined minimum concentration of said at least one undesirable gas;

means responsive to said compensated electrical output signal being beyond said established threshhold range for indicating the presence of at least said predetermined minimum concentration of said at least one undesirable gas within said given area for alarm purposes, and

means responsive to said error-compensated electrical output signal being within said established threshhold range for indicating the presence of at least a predetermined minimum concentration of said different gas within said given area for alarm purposes.

4,443,792

ELECTROMAGNETIC POSITION DETECTOR EMPLOYING FAST FOURIER TRANSFORM ANALYSIS

Brian G. Pidgeon, and Clive R. Bavington, both of Burton-on-Trent, England, assignors to Coal Industry (Patents) Limited, London, England

Filed Aug. 11, 1981, Ser. No. 291,884

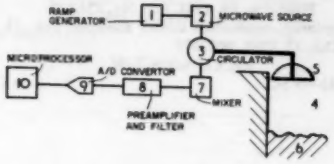
Claims priority, application United Kingdom, Aug. 29, 1980, 8027952

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—612 4 Claims

1. A method of locating the position of an object in a confined space including the steps of creating a high frequency microwave signal, repeatedly varying the frequency of the signal, emitting the repeatedly varied high frequency microwave signal from a relatively stationary source into a confined space, receiving at or adjacent the point of emission of the signal a reflection of the high frequency signal, mixing the received signal with the emitted signal to obtain a beat signal, dividing in a processing circuit the beat signal into a plurality of segments, subjecting each segment to a fast Fourier transform, obtaining a computed discrete frequency spectrum of the transform of each segment, storing said spectrum and summing

a consecutive plurality of the spectra, and calculating the position of the object in the space based on said summed spectra, testing validity of the calculated position of the object by



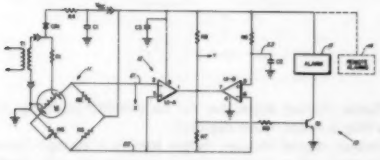
comparing the calculated position with previous calculated positions and preventing a wrong indication, and giving a correct indication of average position of the object when no negative information is received from the validity testing.

4,443,793

GAS DETECTION SYSTEM

Norman M. Hall, Jr., El Paso, Tex., assignor to Calnor of El Paso, El Paso, Tex.

Filed Nov. 2, 1981, Ser. No. 317,444
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—634 **10 Claims**



1. In a gas detection system comprising a gas sensor in a bridge circuit coupled to a voltage comparator to detect an unbalance created when said sensor detects the presence of a gas and a switching circuit and sensible indicator means controlled by said voltage comparator to provide a sensible indication of the detection of a gas, the improvement comprising:

first means coupled to said voltage comparator to automatically inhibit said voltage comparator's control of said switching circuit and sensible indicator means while said gas sensor is stabilizing following initial activation of said gas detection system thereby preventing provision of a false alarm indication of gas detection while said gas sensor is so stabilizing; and

second means coupled to said voltage comparator to automatically inhibit said voltage comparator's control of said switching curcuit and sensible indicator means to prevent staccato false indications of gas detection due to later small, cyclical, inherent drifting changes in the characteristics of said gas sensor following sensor stabilization after initial activation.

4,443,794

CHARACTER PROCESSING DEVICE

Atsushi Sakurai, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

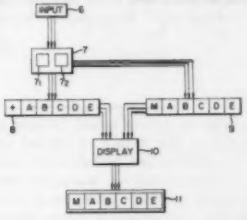
Continuation of Ser. No. 152,732, May 23, 1980. This application Apr. 28, 1982, Ser. No. 372,555
Claims priority, application Japan, Jun. 1, 1979, 54-68559
Int. Cl.³ G09G *1/00*
U.S. Cl. 340—748 **5 Claims**

1. A character processing device comprising:

input means for inputting to said device a plurality of established numeric codes, a first predetermined range of numerical values of said numeric codes representing function codes and a second predetermined range of numerical values of said numeric codes representing character codes;

identifying means for receiving numeric codes input to said device by said input means and identifying each numeric code as a function code or a character code by comparing the numerical value of each received numeric code with the first and second predetermined ranges;

converting means operable when said identifying means identifies a numeric code representing a function code to convert the function code into a classifying character code and a function character code, the classifying character code constituting a signal that a function code has been identified, and the function character code constituting a signal of the function represented by the function code;



memory means including a first memory unit for storing said classifying character code and a second memory unit for storing said function character code;

selecting means for selecting a first character code pattern representative of the classifying character code stored in said first memory unit and a second character code pattern representative of the function character code stored in said second memory unit; and

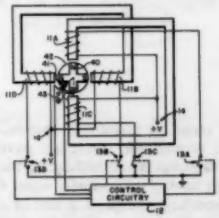
synthesizing means for producing a single code pattern from the first and the second character code patterns respectively selected by said selecting means.

4,443,795

REMOTE INDICATOR FOR DISPLAYING TRANSMITTED DATA BY ANGULAR DISPLACEMENT

John T. Fowler, Salem, Mass., assignor to The Laitram Corporation, New Orleans, La.

Filed Nov. 21, 1979, Ser. No. 96,499
Int. Cl.³ G08C *19/06, 19/12*
U.S. Cl. 340—870.31 **7 Claims**



1. A remote indicator for displaying data contained in a transmitted signal by angular displacement of a rotor comprising:

a rotably mounted magnetic rotor;

a plurality of controllable magnetic field generating means disposed circumferentially around said rotor; and

selection circuitry responsive to said data for sequentially activating alternately each of a plurality of said magnetic field generating means for effectively displacing said rotor

substantially to an angle representative of the value of said data, wherein

said selection circuitry comprises sector selection circuit means for selectively enabling at proper polarity a pair of said generating means appropriate for controlling said rotor within a sector representative of such data and angle selection circuit means for sequentially driving the selected generating means by electrical pulses modulated to drive the rotor within said sector to said angle representative of such data, wherein

said angle selection circuit means comprises memory means for storing for each of a plurality of angles within said sector timing data for the duration of electrical pulses to be applied to said selected magnetic field generating means to displace said rotor to said respective angles.

4,443,796

DOPPLER RADAR

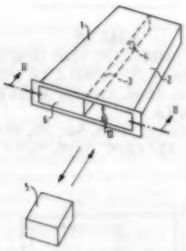
Jörg Müller, Zorneding, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 12, 1981, Ser. No. 262,800

Claims priority, application Fed. Rep. of Germany, May 23, 1980, 3019887

Int. Cl.³ G01S 9/00

U.S. Cl. 343—5 PD 20 Claims



1. Doppler radar for measuring objects, comprising a first and a second substantially prismatic cavity resonator each having sides, each having an end facing the object to be measured and each having substantially equal dimensions, a common wall connecting a respective side of each of said cavity resonators to each other, an oscillator diode disposed in said first cavity resonator, a receiving diode disposed in said second cavity resonator, said end of said first cavity resonator facing the object to be measured being closed and said end of said second cavity resonator facing the object to be measured being open, said common connecting wall having an opening formed therein, said first cavity resonator having another end opposite to said end facing the object, and said opening being spaced from said other end by a distance of $(2n+1)\lambda/4$, where λ is the wavelength of oscillations excited in said first cavity resonator and n is an integral number starting from 0.

4,443,797

RADAR DISPLAY APPARATUS

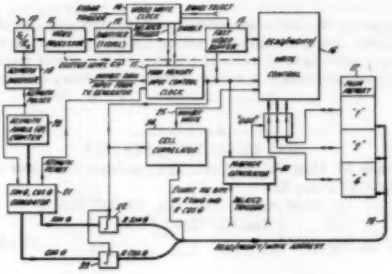
Harry D. Cramp, New Malden; Malcolm R. Blythe, Hove, and Philip D. L. Williams, Banstead, all of England, assignors to Decca Limited, London, England

Filed Jan. 16, 1981, Ser. No. 225,529

Claims priority, application United Kingdom, Jan. 22, 1980, 8002121; Oct. 17, 1980, 8033572

Int. Cl.³ G01S 7/04

U.S. Cl. 343—5 SC 21 Claims



5. Radar display apparatus for an azimuth scanning radar comprising a radar video digitiser;

electronic digital storage means having a storage location for each of a predetermined number of cells forming between them a T.V. type radar display picture;

storage control means for converting the range/azimuth angle coordinates of the received digitised radar video into Cartesian coordinates for identifying the store locations of the corresponding cells in the storage means and for modifying data in the identified locations of said storage means so that the digital data in each said cell location is representative of the degree of positive correlations of digital video returns occurring in the respective cell on successive radar azimuth scans;

T.V. type visual display means; and

display control means arranged to read said digital data from the storage means and to control said display means to provide a substantially real time radar display picture composed of said cells with the brightness of color of each cell being representative of said degree of positive correlation,

wherein the radar video digitiser provides a one bit digital video signal with a logic "0" indicating no video and a logic "1" indicating a positive video return.

4,443,798

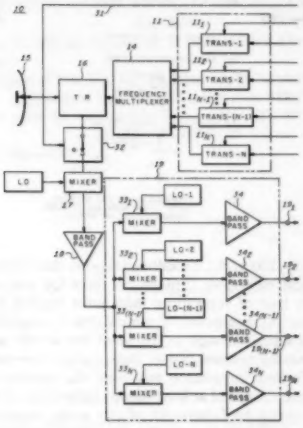
Patent Not Issued For This Number

4,443,799

SPREAD SPECTRUM RADAR

William L. Rubin, Whitestone, N.Y., assignor to Sperry Corporation, New York, N.Y.

Filed Jul. 2, 1981, Ser. No. 279,922
Int. Cl.³ G01S 7/28
U.S. Cl. 343—17.2 PC 10 Claims



1. A spread spectrum radar apparatus comprising:

means for sequentially transmitting a plurality of carrier signals at preselected center frequencies each having a sequential position and each frequency modulated over a time interval chosen for each carrier signal to establish substantially equal bandwidths within each of said time intervals, such that sequence of frequency modulated transmissions with predetermined time bandwidth products is established said carrier signal frequencies and said bandwidth selected such that spectra of adjacent signals in said sequence of signals are substantially non-overlapping;

demultiplexing means having input means coupled to receive echo returns of said sequence of frequency modulated signals and having a plurality of output ports in correspondence with said plurality of carrier signals for providing signals representative of echo returns of each of said frequency modulated signals at said output ports corresponding to said carrier signals;

means having a plurality of input ports coupled correspondingly to said plurality of output ports of said demultiplexer means for pulse compressing each echo return in accordance with said frequency modulation and for providing time delays between said input ports and output ports corresponding therewith for each echo return in accordance with said sequential position of its carrier signal thereby providing signals at said output ports of said pulse compression means substantially in time coincidence;

detector means having a plurality of input ports coupled correspndingly to said plurality of output ports of said pulse compression-time delay means for providing signals representative of detections of signals coupled from said pulse-compression time delay means; and

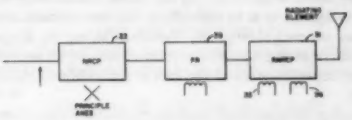
sum means coupled to receive said signals representative of said detections for providing a signal representative of a sum of all time coincident signals received from said detector means.

4,443,800

POLARIZATION CONTROL ELEMENT FOR PHASED ARRAY ANTENNAS

Stanley Gaglione, New Hyde Park, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1982, Ser. No. 367,504
Int. Cl.³ H01Q 3/36
U.S. Cl. 343—372 1 Claim



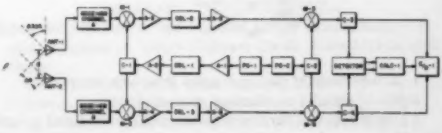
1. A polarization control device having an input of a lineal polarized wave and having an output which comprises said lineal polarized wave phase shifted and rotated in a predetermined manner; a non-reciprocal circular polarizer; a Faraday rotator; a rotatable non-reciprocal circular polarizer having first and second control inputs; said polarizers and said rotator being connected in series between the input and the output of said control device; said Faraday rotator having a controlled input; means supplying the inputs of said Faraday rotator and said rotatable polarizer such that the lineal polarized wave will be phase shifted and rotated in polarization to a predetermined amount; a plurality of radiating devices which form a phased array; and a plurality of polarization control devices each connected to one of the radiating devices for individually controlling the phase output of each radiating device.

4,443,801

DIRECTION FINDING AND FREQUENCY IDENTIFICATION METHOD AND APPARATUS

Dirk R. Klose, Eatontown, and Skudera, Jr. William J., Oceanport, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 15, 1981, Ser. No. 273,806
Int. Cl.³ G01S 5/04
U.S. Cl. 343—442 14 Claims



1. A method for determining the frequency and angle of a plurality of radio frequency signals of differing transmission frequency arriving essentially simultaneously at each of N spatially separated antennae of a radio frequency receiver, where $N \geq 2$, comprising:

a first processing step wherein the received radio frequency signals arriving at each antenna are processed in such a

manner as to obtain N composite signals, each representative of the plurality of radio frequency signals arriving at one of the antennae, all retaining the phase relationship of those radio frequency signals resulting from the spatial separation of the antennae, each having a frequency component representative of each of those radio frequency signals arriving at the antenna with which it is associated, and each being of suitable amplitude and frequency for further processing in a dispersive delay line;

introducing all of the N composite signals into dispersive delay lines, while retaining the phase relationship among those signals, so as to separate, in the time domain, components of each composite signal differing in frequency while retaining the phase relationship of those components representative of the spatial separation of the antennae;

a second processing step wherein the components of each of the composite signals are processed so as to determine the frequency of the radio frequency signal which they represent based on the position of each of the components in the time domain after their separation in the dispersive delay line while retaining the phase relationship of those components representative of the spatial separation of the antennae;

detecting the electrical phase relationship among components of the same frequency of different of the composite signals thereby determining electrical phase information about those signals;

converting the electrical phase information to angle of arrival information;

correlating the angle of arrival information for each component of each composite signal with the frequency information relative to that component; and

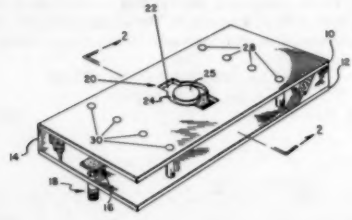
outputting the correlated information.

4,443,802

STRIPLINE FED HYBRID SLOT ANTENNA

Paul E. Mayes, Champaign, Ill., assignor to University of Illinois Foundation, Urbana, Ill.

Filed Apr. 22, 1981, Ser. No. 256,424
Int. Cl.³ H01Q *13/18*
U.S. Cl. 343—729 **12 Claims**



1. A substantially planar antenna structure comprising:

a pair of parallel conducting ground planes;

a hybrid aperture formed into the uppermost of said ground planes, said aperture including elongated outer sections which are sustantially rectangular in shape, and an inner substantially circular section, the interior of said circular section containing a conductive portion concentric with said circular section;

a first linear conductor disposed between and parallel to said ground planes, the length of said linear conductor spanning said entire hybrid aperture; and

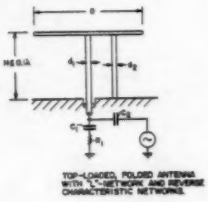
means for feeding a radio frequency signal to or from said linear conductor.

4,443,803

LOSSY MATCHING FOR BROAD BONDING LOW PROFILE SMALL ANTENNAS

Charles M. DeSantis, Neptune, N.J.; Albert H. Zannella, Mount Carmel, Pa.; Michael W. Begala, Fairhaven, N.J.; John R. Wills, Ocean Grove, N.J., and Watson P. Czerwinski, Forked River, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 142,917, Apr. 23, 1980, Pat. No. 4,328,501.
This application Nov. 23, 1981, Ser. No. 323,835
Int. Cl.³ H01Q *9/36*
U.S. Cl. 343—749 **4 Claims**



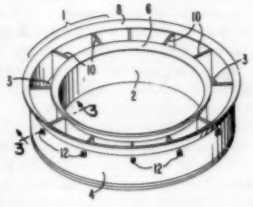
1. A VHF, 1–200 MHZ, broadband smaller than 0.1λ height, folded vertical monopole, top-loaded, base-fed antenna unit comprising a pair of supporting mast units topped by a flat capacitive disc at one point of which disc is connected the antenna feed signal through an insulated line within one mast of the antenna, the antenna further comprising a base matching circuit for further impedance matching the antenna over a broad frequency range of at least substantially three to one, the circuit comprising an L-network of one series capacitor and resistor, in parallel with a further matching capacitor, the elements of the matching circuit selected so that circuit reactance is a decreasing function of frequency, offsetting antenna reactance over at least the broad frequency range of 30–88 MHZ.

4,443,804

MODIFIED DIFFERENCE MODE COAXIAL ANTENNA WITH FLARED APERTURE

Terry M. Smith, La Honda, Calif., assignor to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Sep. 28, 1981, Ser. No. 306,058
Int. Cl.³ H01Q *13/02*
U.S. Cl. 343—786 **8 Claims**



1. A coaxial waveguide antenna for propagating electromagnetic radiation in the TE_{n1} mode, where n is a positive integer greater than or equal to 3, comprising:

an inner conductive cylindrical wall;

coaxially aligned with said inner wall, an outer conductive cylindrical wall having a diameter greater than that of said inner wall, said two walls forming therebetween a cavity of generally toroidal shape;

said cavity being closed on one end by a conductive ring, and open on a second end; and

at least 2n excitation probes equally spaced radially within said cavity;

wherein sinusoidal electromagnetic energy at a certain angular phase and the same frequency is applied to each of said probes;

wherein the phase differences between each set of adjacent probes are equal; and

said phase progresses through n 360° revolutions as said cavity is radially traversed once.

4,443,805

PLATE-TYPE ANTENNA WITH DOUBLE CIRCULAR LOOPS

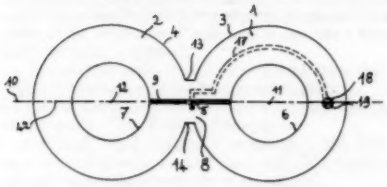
Henri A. P. Havot, 13, rue de la Prée, 35510 Cesson-Sevigne, France

Continuation of Ser. No. 96,759, Nov. 23, 1979, abandoned. This application Dec. 10, 1981, Ser. No. 329,318

Claims priority, application France, Nov. 27, 1978, 78 34424

Int. Cl.³ H01Q *9/26*

U.S. Cl. 343—803 **10 Claims**



1. A plate-type antenna comprising an aligned pair of symmetrical conductive circular rings contiguously lying side-by-side in a common plane with a slit joining two openings formed by the centers of the rings, said slit being oriented to lie in the direction of an axis which joins the centers of the openings, said pair of rings being positioned tangentially to each other with a tangency zone of the rings being narrow in a direction which is perpendicular to said axis, means for energizing one edge of said slit at a point which is near a center of symmetry of the antenna, and means for connecting to ground a middle point of at least one ring located on said axis and on a side of the tangency zone which is opposite said point.

4,443,806

DATA RECORDING MEDIUM

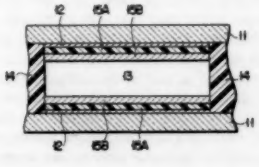
Hideo Ando, Hino, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 7, 1981, Ser. No. 309,405

Claims priority, application Japan, Oct. 9, 1980, 55-141718; Oct. 9, 1980, 55-141721; Oct. 9, 1980, 55-141723; Jan. 20, 1981, 56-5874

Int. Cl.³ G01D *15/34*

U.S. Cl. 346—135.1 **4 Claims**



1. A data recording medium comprising:

a pair of disc-shaped substrates;

means for mounting said substrates opposing each other at a distance including a pair of coaxial, ring-shaped spacers of different sizes sealed between the opposing surfaces of said disc shaped substrates coaxially therewith and forming an annular space therebetween;

a radiation-sensitive recording layer formed on an opposing surface of each of said substrates;

an organic protective layer formed on said recording layer;

an inorganic protective layer formed on said organic protective layer, and

a reinforcing member arranged within said annular space so as to be slidable relative to said protective layer.

4,443,807

INK JET PRINT HEAD

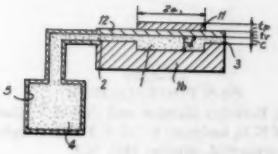
Haruhiko Koto, Shiojiri, Japan, assignor to Epson Corporation, Nagano and Kabushiki Kaisha Suwa Seikosha, Tokyo, both of, Japan

Filed Nov. 25, 1981, Ser. No. 325,153

Claims priority, application Japan, Nov. 28, 1980, 55-168719

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R **15 Claims**



1. An ink jet print head for projecting droplets of ink on demand comprising a pressurization chamber including at least one wall, said wall defining a vibratory plate, a nozzle means open to said pressurization chamber and defining a fluid passage through which said ink is ejected, a piezoelectric element means operatively coupled to said vibratory plate, said piezoelectric element means altering the volume of said pressurization chamber when selectively energized by a drive voltage to eject ink through said nozzle means, said piezoelectric element means and said vibratory plate defining a vibratory system, the acoustic capacitance of said vibratory system being less than or equal to 9×10^{-17} m^5/N and such amount that a drive voltage V expressed by the following equation:

$$V=\sqrt{\frac{2\chi^2 Co}{K^2 Cp}}$$

may be approximately minimum.

4,443,808

SEMICONDUCTOR DEVICE

Kazuo Kihara, Tokyo, and Masashi Ikeda, Urawa, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 2, 1982, Ser. No. 365,012

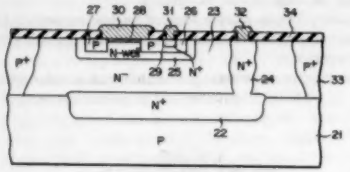
Claims priority, application Japan, Apr. 7, 1981, 56-52034

Int. Cl.³ H01L *29/48, 29/72, 27/02, 29/34*

U.S. Cl. 357—15 **5 Claims**

1. A semiconductor device comprising a semiconductor substrate of a first conductivity type, a buried layer of a second conductivity type selectively formed on said semiconductor substrate, a semiconductor layer of the second conductivity type formed on said semiconductor substrate and burried layer, a first diffusion layer of the first conductivity type formed in said semiconductor layer, and a second diffusion layer of the second conductivity type formed in said first diffusion layer, a Schottky barrier diode being formed in a surface region of said

semiconductor layer adjacent to said first diffusion region, a well layer of the second conductivity type of a higher impurity



concentration than that of said semiconductor layer being formed at least under said Schottky barrier diode.

4,443,809

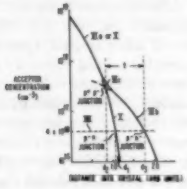
P-I-N PHOTODIODES

Aland K. Chin, Berkeley Heights, and Bulusu V. Dutt, Parsippany, both of N.J., assignors to AT & T Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 154,046, May 28, 1980. This application Jul. 29, 1982, Ser. No. 402,921

Int. Cl.³ H01L *29/161*

U.S. Cl. 357—16 **6 Claims**



1. A photodiode (10) comprising:

an i-type semiconductor active region (16) in which light (18) to be detected is absorbed to generate photocarriers,

a pair (12, 14) of opposite-conductivity type semiconductor zones on opposite sides of said active region for collecting said photocarriers, one (14) of said zones forming a p-i type first junction (15) at its interface with said active region, and the other (12) of said zones form an i-n second junction (17) at its interface with said active region (16), CHARACTERIZED IN THAT

said photodiode includes a relatively low-doped semiconductor body (12),

acceptors in said body from an anomalous diffusion profile (FIG. 3) of net impurity concentration versus depth into said body including upper and lower monotonically decreasing segments (VIa and b) connected by an upwardly concave segment (VIc),

the carrier concentration (VII) of said body is less than the net carrier concentration corresponding to said concave segment, said first junction (15) comprises a p-i junction at approximately the depth of said concave segment, said second junction (17) comprises an i-n junction at approximately a depth corresponding to the intersection of said lower segment (VIb) and the carrier concentration (VII) of said body, and said active region comprises a compensated i-region between said junctions.

4,443,810

GATE TURN-OFF AMPLIFIED THYRISTOR WITH NON-SHORTED AUXILIARY ANODE

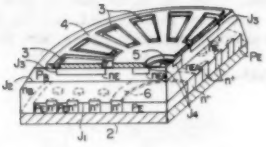
Tsutomu Yatsuo, and Takahiro Nagano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

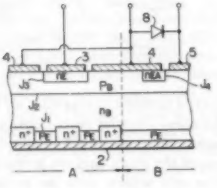
Continuation of Ser. No. 112,811, Jan. 17, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,536

Claims priority, application Japan, Jan. 24, 1979, 54-6067

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **10 Claims**





1. A gate turn-off thyristor comprising:

a semiconductor substrate including a first semiconductor layer of a first conductivity type, a second semiconductor layer of a second conductivity type, a third semiconductor layer of said first conductivity type and a fourth semiconductor layer of said second conductivity type, said first, second, third and fourth layers being stacked in the order described to form a laminate, a fifth semiconductor layer of said second conductivity type being adjacent to said third semiconductor layer and being spaced apart from said fourth semiconductor layer, said first, second, third and fourth semiconductor layers making up a main thyristor, said first, second, third and fifth semiconductor layers making up an auxiliary thyristor;

a first main electrode disposed in low-resistance contact with said first semiconductor layer and said second semiconductor layer in the main thyristor portion of said semiconductor substrate, and disposed in low-resistance contact with only said first semiconductor layer in the auxiliary thyristor portion of said semiconductor substrate, so that said first and second semiconductor layers in said main thyristor portion are short-circuited by said first main electrode while said first and second semiconductor layers in said auxiliary thyristor portion are unshorted by said first main electrode;

a second main electrode disposed in low-resistance contact with said fourth semiconductor layer;

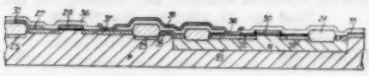
a control electrode disposed in low-resistance contact with said third semiconductor layer; and

an auxiliary electrode disposed in low-resistance contact with said third and fifth semiconductor layers.

4,443,811
CMOS INTEGRATED CIRCUIT DEVICE

Graham S. Tubbs, Houston, and James E. Ponder, Cat Spring, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 81,513, Oct. 3, 1979, Pat. No. 4,295,897. This application Oct. 13, 1981, Ser. No. 310,019
Int. Cl.³ H01L 27/02, 29/78, 29/04
U.S. Cl. 357—42 5 Claims



1. A CMOS integrated circuit device having both N-channel and P-channel insulated gate field effect transistors comprising:

(a) a P-type silicon substrate,

(b) an N-type tank region formed in a portion of a face of said substrate, the plane of the face of said substrate above said N-type tank region being slightly displaced from the plane of the remainder of said face to provide a discontinuity for mask alignment,

(c) a first surface area of said face spaced from the tank region for inclusion of the N-channel transistor,

(d) a second surface area of said face within the tank region for inclusion of the P-channel transistor,

(e) thick field oxide separately surrounding the first and second surface areas on said face, said field oxide being spaced on said face from said discontinuity,

(f) first and second conductive gates overlying thin gate insulator on said first and second surface areas, respectively,

(g) N-type source and drain regions in said face at the first surface area on opposite sides of the first gate and aligned therewith,

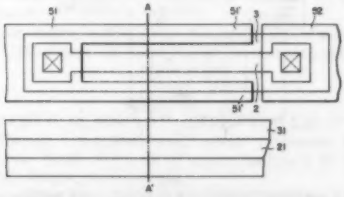
(h) P-type surce and drain regions in said face at the second surface area on opposite sides of the second gate and aligned therewith,

(i) and metal film overlying said face but insulated therefrom, and contacts from said metal film to selected ones of said source and drain regions.

4,443,812
HIGH-BREAKDOWN-VOLTAGE SEMICONDUCTOR DEVICE

Ichiro Imaizumi, Tokyo; Masatoshi Kimura, Hachioji; Shikayuki Ochi, Akishima; Masayoshi Yoshimura, Tokyo; Takashi Yamaguchi, Tachikawa, and Toyomasa Koda, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1981, Ser. No. 231,285
Claims priority, application Japan, Feb. 4, 1980, 55-11506
Int. Cl.³ H01L 29/44, 27/04, 29/72
U.S. Cl. 357—53 4 Claims

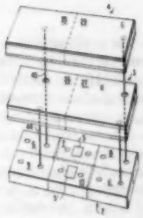


1. A high-breakdown-voltage semiconductor device having a semiconductor body of a first conductivity type, a first impurity region of a second conductivity type disposed in a surface region of the body, and a plate layer disposed on an insulating film provided on said surface of the body, a second impurity region of said second conductivity type which is disposed in contact with said first impurity region and is doped lower than said first impurity region, and wherein said plate layer comes into contact with a first part of said first impurity region through a hole provided in said insulating film and extends overlying said second impurity region and does not overlie said first impurity region except for a second part of said first impurity region surrounding said first part of said first impurity region.

4,443,813
SOLID-STATE COLOR IMAGER WITH TWO LAYER THREE STORY STRUCTURE

Masatoshi Tabei, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 8, 1983, Ser. No. 512,051
Int. Cl.³ H04N 9/07
U.S. Cl. 358—44 13 Claims



1. A solid-state color imager, comprising:

a solid-state base comprised of an array of electrical switching elements arranged on portions of said base with a plurality of photosensitive elements associated, respectively, with a first plurality of said electrical switching elements;

a first layer of insulation material positioned over said base;

a first photosensitive layer superimposed on said first layer of insulation material, said first photosensitive layer being comprised of a top transparent electrode sublayer, a back transparent mosaic electrode sublayer, and a photoconductive sublayer positioned between said top and back sublayers, said back mosaic electrode sublayer being segmented into an array of portions corresponding to a second plurality of said electrical switching elements on said base, and said segmented portions of said back mosaic electrode sublayer being electrically connected, respectively, with said second plurality of said electrical switching elements on said base;

a second layer of insulation material positioned over said first photosensitive layer;

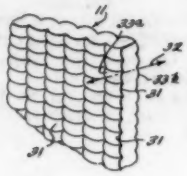
a second photosensitive layer superimposed over said second layer of insulation material, said second photosensitive layer being comprised of a top transparent electrode sublayer, a back transparent mosaic electrode sublayer, and a photoconductive sublayer positioned between said top and back sublayers, said back mosaic electrode being segmented into an array of portions corresponding to a third plurality of said electrical switching elements on said base, and said segmented portions of said back mosaic electrode being electrically connected, respectively, to said third plurality of said electrical switching elements on said base;

said first and second photosensitive layers being sensitive to and absorptive of different ranges of the visible wavelength spectrum, whereby electrical signals from said photosensitive layers represent light intensities of two different color ranges and wherein said photosensitive elements on said base represent light intensities of a third color range.

4,443,814
REAR PROJECTION APPARATUS

Leo Mori, Yokohama; Takashi Aoba, Ageo, and Mamoru Tominaga, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 14, 1981, Ser. No. 311,399
Claims priority, application Japan, Nov. 10, 1980, 55-157891
Int. Cl.³ H04N 9/31; G03B 21/60
U.S. Cl. 358—60 9 Claims



1. A rear projection apparatus comprising:

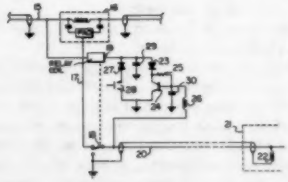
a rear transmitting screen including a convex lens array formed on both surfaces thereof, each said convex lens having spherical surface formed on one surface of said screen having a corresponding spherical convex lens formed on the other surface of said screen with a common optical axis, the focal point of said each convex lens formed on one surface of said screen being on the surface of the corresponding convex lens formed on the other surface of said screen, the surfaces of said convex lenses from which light emerges are shielded to block light except in light passing portions corresponding to said focal point of said each corresponding convex lens, and said surfaces of said convex lenses from which light emerges corresponding to said light passing portions are separated into a plurality of colored regions to pass light having specific wave length; and

a projector for projecting an optical image onto a surface of said screen.

4,443,815
WIRED PROGRAM DISTRIBUTION SYSTEM TAMPER DETECTOR

L. Bruce Hempell, Almonte, Canada, assignor to Nabu Manufacturing Corporation, Almonte, Canada

Filed Jun. 25, 1981, Ser. No. 277,187
Claims priority, application Canada, Mar. 20, 1981, 373561
Int. Cl.³ H04N 7/16; H01H 9/00
U.S. Cl. 358—114 11 Claims

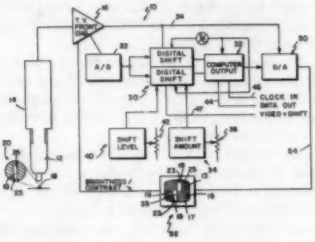


1. A connector circuit for an R.F. line signal feed to a subscriber port, comprising a pair of conductors adapted to be connected to a pair of terminals of a security device or subscriber's set which has an input impedance between said terminals which includes a direct current path and a predetermined load impedance to signal frequencies, means for connecting one of said conductors to a source of common potential, means for applying an R.F. signal to the other of said conductors, means for applying a rectified A.C. current via said other of the conductors for passage through the direct current path, means for detecting interruption of the rectified A.C. current in the event of disconnection of at least one of said terminals from the connector, and means for switching and latching the R.F. signal, but not the rectified A.C. current, off from said other conductor upon said detection of the interruption of said rectified A.C. current.

4,443,816
DIGITAL VIDEO IMAGE SPLITTER

Robert D. Hogan, Jr.; Narendra T. Sanghvi, and Richard F. Morris, all of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Inc., Indianapolis, Ind.

Filed Apr. 28, 1982, Ser. No. 372,578
Int. Cl.³ H04N 7/18
U.S. Cl. 358—160 20 Claims

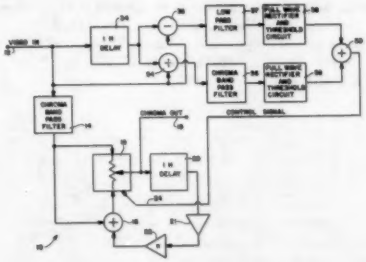


1. An apparatus for splitting an image comprising means for receiving a video image signal, means for digitizing the video image signal, means for coupling the receiving means to the digitizing means, means for shifting a first portion of the digitized image signal relative to a second portion of the digitized image signal to split the image, and means for coupling the digitizing means to the shift means.

4,443,817
CHROMA NOISE REDUCTION SYSTEM FOR QUADRATURE MODULATED COLOR TELEVISION PICTURE SIGNALS

Yves C. Faroudja, 26595 Anacapa Dr., Los Altos Hills, Calif. 94022

Filed Nov. 25, 1981, Ser. No. 325,039
Int. Cl.³ H04N 5/21
U.S. Cl. 358—167 21 Claims



1. An improved method for reducing noise in a chrominance component of a quadrature modulated color television signal wherein said chrominance component has been separated therefrom, said method comprising the steps of:

a. delaying said chrominance component by a period equal to an integral function of the television line period to provide a delayed chrominance component;

b. phase inverting said delayed chrominance component;

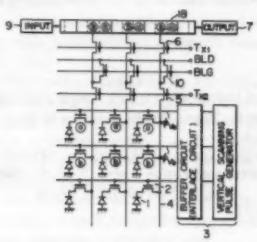
c. combining a predetermined amount of said delayed and inverted chrominance component with said chrominance component to provide a chrominance composite;
d. detecting vertical level transitions in a luminance component of said color television signal and generating a control signal proportional to each said detected vertical level transition;
e. normally putting out said chrominance composite, and proportionally switching to said chrominance component in response to said control signal.

4,443,818

SOLID-STATE IMAGING DEVICE

Shinya Ohba, Kanagawa; Masaaki Nakai, Kodaira; Toshifumi Ozaki, Tokyo, and Kenji Takahashi, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 10, 1981, Ser. No. 329,609
Claims priority, application Japan, Dec. 12, 1980, 55-177605
Int. Cl.³ H04N *3/14*; G11C *7/06*
U.S. Cl. 358—213 **16 Claims**



1. A solid-state imaging device comprising:
a photosensing part including a matrix of photo-electric conversion elements to form a plurality of vertically arranged horizontal rows of picture elements;
a CTD serving as a read-out shift register, said CTD having therein a plurality of storage regions;
transfer means for transferring, a first set of signals from the picture elements in a first selected one of said horizontal picture element rows of said photosensing part and thereafter a second set of signals from the picture elements in a second selected horizontal picture element row of said photosensing part, into selected intermittent ones of said storage regions of said CTD during one horizontal blanking period;
means for shifting each of the signals of said first set stored in the selected intermittent storage regions into the next adjacent storage regions, said second set of signals being transferred by said transfer means from said photosensing part into the selected intermittent storage regions which have been vacated by the shifting of said first set of signals; and
means for reading both said first and second sets of signals in said CTD therefrom in one horizontal scanning period.

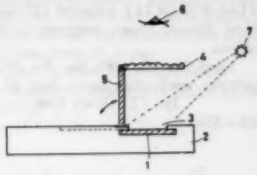
4,443,819

LIQUID CRYSTAL DISPLAY SCREEN FOR USE IN TV

Fumiaki Funada, Yamatokoriyama; Toshiaki Takamatsu, Tenri, and Tomio Wada, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 25, 1982, Ser. No. 342,407
Claims priority, application Japan, Jan. 27, 1981, 56-10633[U]
Int. Cl.³ H04N *5/74*
U.S. Cl. 358—236 **10 Claims**

1. A liquid crystal display device comprising:
a housing;
a liquid crystal display panel mounted in said housing and producing a display image;
an optical lens magnifying said display image;
a support arm having said lens pivotally mounted on one end thereof and being pivitally mounted on said housing at



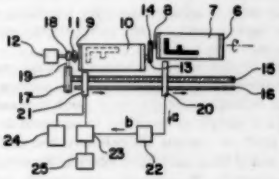
the other end thereof, said support arm supporting said lens spaced apart from said display panel in a display mode and folding to place said lens in juxtaposition with said housing in a retracted mode.

4,443,820

PROCESS FOR PREPARING HECTOGRAPHIC PRINTING MASTERS

Masayuki Mutoh, Machida; Takanobu Ishidoh, Yokohama, and Toshihiro Hayashi, Mitaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Nov. 6, 1980, Ser. No. 206,856
Claims priority, application Japan, Nov. 6, 1979, 54-144028; Dec. 5, 1979, 54-158583; Dec. 5, 1979, 54-158584
Int. Cl.³ H04N *1/22*; G01D *15/18*
U.S. Cl. 358—296 **12 Claims**



1. A process for preparing a hectographic printing master suitable for use in a hectographic printing process of the type wherein the printing master is applied under slight pressure to sheets of reproduction paper previously impregnated with alcohol, and during each printing operation a small amount of ink deposited in image configuration on the printing master is transferred to the respective sheet by being dissolved in the alcohol therein, thereby forming a reproduction of the image, said process comprising:
dispensing more than 10 percent by weight of a dye stuff in a hydrocarbon of the thermally dissoluble type, thereby forming an ink which is solid at room temperature and liquid at an elevated temperature and which is capable of being dissolved bit-by-bit in the alcohol of sheets of hectographic reproduction paper, thereby being suitable for use in hectographic printing, and which is capable when in liquid form of being discharged as fine droplets by an ink jet generating unit;
heating said ink to said elevated temperature and thereby causing said ink to be in liquid form;
detecting an original image configuration;
depositing said ink on a master substrate by discharging from an ink jet generating unit said ink in liquid form as droplets in accordance with said detected original image configuration; and
cooling the thus deposited ink, and thereby forming on said master substrate an image configuration of solidified ink in a form suitable thereafter for use in the hectographic

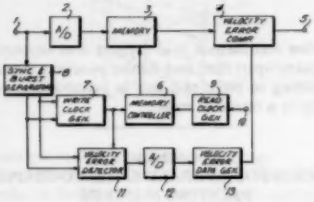
printing of a plurality of reproductions of said original image.

4,443,821

DIGITAL VELOCITY ERROR COMPENSATOR

Tetsuro Kato, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 332,250
Claims priority, application Japan, Dec. 22, 1980, 55-182493
Int. Cl.³ H04N 9/491
U.S. Cl. 358—326 **20 Claims**



1. Velocity error compensator apparatus for use in a time base corrector of the type having a main memory into which successive samples of a video signal are written at a write-in rate synchronized with time base errors in said video signal, such that plural lines of said video signal are stored in said main memory, and from which said successive samples are read at a constant read-out rate, said velocity error compensator apparatus comprising:

velocity error detecting means for detecting velocity errors in successive lines of said video signals written into said main memory; and

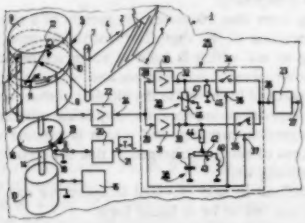
sample level compensating means for compensating the level of a sample read out from said main memory as a function of the detected velocity error, such that said level of said read out sample is modified to be equal to the level that said read out sample should have had at the time it was read out if there had been no velocity error.

4,443,822

REPRODUCING APPARATUS

Gerhard Furtner, Judenau, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1982, Ser. No. 345,182
Claims priority, application Austria, Feb. 6, 1981, 554/81
Int. Cl.³ G11B 5/02, 15/44, 15/45
U.S. Cl. 360—67 **4 Claims**



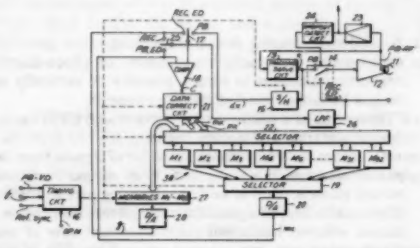
1. An apparatus for reproducing information signals recorded on a record carrier in the form of a tape, which apparatus comprises two rotatable reproducing heads each consecutively co-operating with the record carrier during a given scanning period in order to reproduce the recorded information signals, means for detecting the rotary position of the heads relative to the record carrier, said detecting means supplying a position signal indicative of which of said heads is cooperating with said record carrier, a common pre-amplifier which is connected to the reproducing heads, a pair of signal-correction compensation stages each associated with a respective one of the reproducing heads, said stages each having an input which is connected to an output of said pre-amplifier and an output for supplying an output signal for a signal-processing circuit which follows the compensation stages, and means responsive to said position signal for applying the output signal at the output of the compensation stage associated with the reproducing head which instantaneously co-operates with the record carrier to the signal-processing circuit during the scanning period of the relevant reproducing head, wherein only one of the two signal-correction compensation stages associated with said reproducing heads comprises an adjustable frequency-dependent network for frequency-response correction and at least one of said two compensation stages comprises a further adjustable frequency-independent network for amplitude correction so as to match the frequency response and the amplitude characteristics of the two reproducing heads to each other.

4,443,823

CONTROLLING THE TRACE OF A ROTARY HEAD

Hitoshi Sakamoto, Zama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 3, 1981, Ser. No. 317,867
Claims priority, application Japan, Nov. 12, 1980, 55-159111
Int. Cl.³ G11B 5/52, 21/04
U.S. Cl. 360—77 **26 Claims**



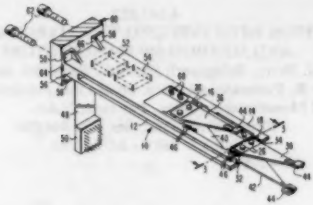
1. Apparatus for controlling the position of a rotary head mounted on a deflection device as said head scans successive tracks on a record medium, comprising tracking drive signal generating means for generating tracking drive signals as a function of the deviation of said head relative to a track being scanned thereby: sampling means coupled to said tracking drive signal generating means for sampling said tracking drive signals at successive locations along said track to produce successive samples as said head scans said track; storage means for storing corrected samples of tracking drive signals; comparator means coupled to said sampling means and to said storage means for comparing said successively produced samples to a stored tracking drive signal sample to detect a difference therebetween; correction means coupled to said comparator means and responsive to a detected difference for selectively correcting a tracking drive signal sample stored in said storage means by a predetermined amount irrespective of the actual difference between the produced sample and the stored tracking drive signal sample to produce a corrected sample; means for returning said corrected samples of said tracking drive signal to said storage means; and supply means for selectively supplying said generated tracking drive signals or a corrected tracking drive signal derived from said storage means to said deflection device for deflecting said head.

4,443,824

MAGNETIC HEAD ARM ASSEMBLY

Norman K. Frater; Gregory G. Gill, and Robert B. Watrous, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,499
Int. Cl.³ G11B 5/48
U.S. Cl. 360—104 7 Claims



1. A magnetic head-arm assembly for use in a disk file apparatus for supporting a plurality of magnetic transducers, said assembly comprising;

a unitary, substantially flat, generally rectangular arm having an opening adjacent one longitudinal end to form two spaced legs joined by a plurality of integrally formed transversely extending bridges, and channels formed in the opposite longitudinal sides of the arm to minimize mass for improving access time;

suspension members secured by screws to both the upper and lower sides of each bridge for operatively supporting a respective magnetic transducer; and

at least one electronic circuit module connected to at least one of the flat surfaces of said arm adjacent its opposite longitudinal end,

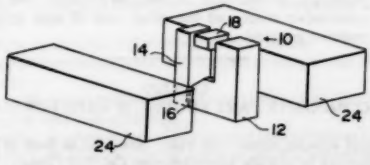
each of said channels having at least one aperture communicating with the opening in said arm to allow air to flow through the arm for cooling each circuit module.

4,443,825

MAGNETIC HEAD POLE PIECE MOUNT OF TiO_2-CAO

Larry A. Wank, Cornwallville, and Joseph G. Braitling, Saugerties, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,914
Int. Cl.³ G11B 5/12
U.S. Cl. 360—104 3 Claims



1. A magnetic head which comprises:

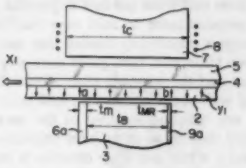
first and second pole pieces having a magnetic gap disposed therebetween and means for mounting said pole pieces which includes a nonmagnetic material supporting said pole pieces, said nonmagnetic material having a composition which, by weight, is between 10 and 30% calcium oxide and between 70 and 90% titanium dioxide and up to 2% zirconium dioxide.

4,443,826

MAGNETO-RESISTIVE EFFECT TYPE MAGNETIC HEAD

Takeshi Sawada, Yokohama; Ko Yoneda, Kawasaki; Akira Shinmi, Kawasaki; Hiroshi Takagi, Kawasaki; Shuzo Abiko, Chichibu, and Hirokazu Goto, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Oct. 23, 1981, Ser. No. 314,417
Claims priority, application Japan, Oct. 29, 1980, 55-150646; Nov. 7, 1980, 55-155843
Int. Cl.³ G11B 5/12, 5/30, 5/25
U.S. Cl. 360—113 5 Claims



1. A magneto-resistive effect type magnetic head for recording on and reproducing from a recording medium, said magnetic head comprising:

a subsidiary magnetic pole formed of a high permeability material and having a coil turned around the magnetic pole;

a substrate disposed in opposition to said subsidiary magnetic pole;

a main magnetic pole formed of a magneto-resistive effect element arranged on a side of said substrate where a recording medium in motion enters said head; and

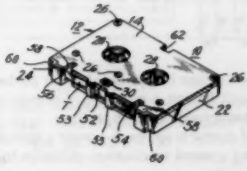
a recording magnetic pole formed of a high permeability material arranged on a side of said substrate where the recording medium in motion leaves the head.

4,443,827

TAPE CASSETTE

John W. Hoover, Huntington; Raymond C. Chapman, Ridgefield; Dominick F. Dammassa, and Richard G. Rutkowski, both of Milford, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Jun. 15, 1982, Ser. No. 388,540
Int. Cl.³ G11B 23/08
U.S. Cl. 360—132 13 Claims



1. In a thumb-sized tape cassette having a rectangular housing formed of top and bottom walls and a peripheral wall extending between said top and bottom walls, said peripheral wall having front, back and side portions; supply and take-up reel hubs contained within said housing; a tape member wound about respective ones of said hubs to form supply and take-up reels and movable therebetween to be unwound from one and wound upon the other; a pair of tape guide rollers positioned within said housing in the vicinity of the front corners of said housing for guiding said tape member thereabout and defining a tape run parallel to and behind said front portion of said peripheral wall; said front portion of said peripheral wall hav-

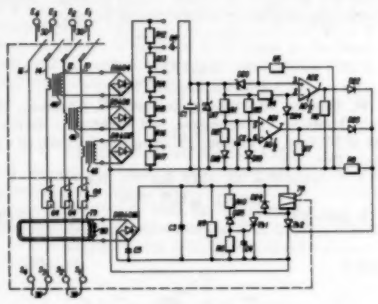
ing at least a center and opposite side openings therein through which said tape run is accessed, said side openings being positioned on either side of said center opening, each side opening being operative to receive a transducer to contact said tape member and said center opening being operative to receive a pinch roller when said tape cassette is loaded into a tape record and/or playback device; a hole in each of said top and bottom walls coaxially aligned and positioned adjacent the center opening of said front position of said peripheral wall to receive a capstan when said tape cassette is loaded into said device; the improvement comprising a pair of notches disposed in said top and bottom walls on opposite sides of said side openings of said front portion of said peripheral wall and spaced remotely from said center opening, said notches extending rearwardly into said housing from said front portion in parallel planes that are substantially perpendicular to said tape run, whereby when said tape cassette is operatively loaded into said device, either notch receives a bifurcated tape guide normally mounted with said transducer; and the opposite ends of said front portion of said peripheral wall at the corners formed with the respective side portions are recessed relative to the part of said front portion adjacent thereto so as to form respective steps at said corners, whereby when said tape cassette is loaded into said device said steps cooperate with guide means in said device to position said tape cassette in predetermined alignment.

4,443,828

LOW VOLTAGE CIRCUIT BREAKER

Michel Legrand; Paul Canonne, both of Barentin, and Christian Brault, Pavilly, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Mar. 2, 1982, Ser. No. 353,820
Claims priority, application France, Mar. 10, 1981, 81 05153
Int. Cl.³ H02H *3/08*
U.S. Cl. 361—93 **4 Claims**



1. A low voltage circuit breaker for protecting an electrical power circuit having a plurality of power conductors against fault current conditions comprising:

a pair of contacts for each power conductor,

a tripping control mechanism effective to separate said pair of contacts,

a tripping relay to operate said tripping control mechanism,

a current sensing unit associated with each of the power conductors of the circuit protected by the circuit breaker to detect the current flowing in the respective power conductors and develop an output signal corresponding to the current in said power conductors,

and an electronic signal processing unit to process the output signal emitted by the said current sensing unit in order to deliver to the said relay a tripping signal when the said current exceeds a predetermined threshold, said current sensing unit including:

a magnetic circuit with three parallel branches, two outer and one intermediate branch,

a secondary winding mounted on the intermediate branch and providing said output signal,

two openings each provided between the winding and one of the outer branches,

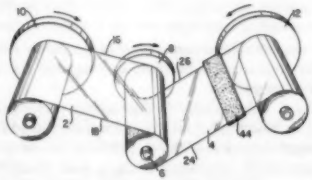
and a primary winding serially connected with said power conductor and having a conductor portion selectively running through one or two of said openings to provide a primary winding with one or two current paths.

4,443,829

CAPACITOR WITH INTEGRAL DISCHARGE RESISTOR AND METHOD OF MANUFACTURE

Robert J. Delvy, Bridgeport; Harry L. Pentecost, Monroe, and Leroy R. Patterson, Guilford, all of Conn., assignors to Universal Manufacturing Corp., Paterson, N.J.

Filed Nov. 8, 1982, Ser. No. 440,096
Int. Cl.³ H01G *1/11, 4/38*
U.S. Cl. 361—275 **16 Claims**



1. A capacitor with an integral discharge resistor, comprising:

a sheet of electrically insulating material having first and second outer edges;

first and second sheets of electrically conductive material in spaced, opposed relationship, said electrically insulating sheet being disposed therebetween, said first conductive sheet extending outwardly at least up to said second edge, there being provided a non-conductive margin along said first edge at which said first electrically conductive sheet cannot be contacted, said second conductive sheet extending outwardly at least to said first edge, there being provided a second non-conductive margin along said second edge at which electrical contact cannot be made with said second conductive sheet;

at least one section of electrically resistive material mounted in spaced relationship from said first and second conductive sheets and extending between and, at least, to said first and second edges;

first connecting means disposed at said second edge for providing an electrical connection between said first conductive sheet and one end of said section of resistive material;

second connecting means disposed at said first edge for providing an electrical connection between said second conductive sheet and the other end of said section of resistive material.

4,443,830

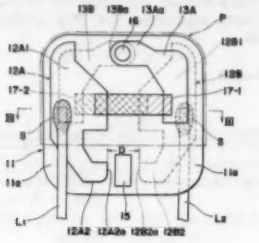
CR COMPOSITE PART PROVIDED WITH DISCHARGE GAP

Toshimi Kaneko, Sabae, and Yukio Hata, Fukui, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Mar. 30, 1983, Ser. No. 480,336
Claims priority, application Japan, Apr. 6, 1982, 57-50150[U]
Int. Cl.³ H01G *1/11;* H01L *27/02*
U.S. Cl. 361—275 **11 Claims**

1. A CR composite part provided with discharge gap, which comprises a substrate (11) of dielectric material, a plurality of capacitor-forming electrodes (12A, 13B, 13A, 12B) respectively provided on opposite surfaces of the substrate so as to confront each other through said substrate held therebetween,

a CR composite circuit constituted by bridging, through resistance, the predetermined electrodes (**12A, 13A, 12B, 13B**) of said plurality of capacitor-forming electrodes respectively provided on the same surfaces of said substrate and also by electrically connecting the one predetermined electrode (**13A**) on one surface of said substrate to the other predetermined electrode (**13B**) on the other surface of said substrate, and two discharge electrodes (**12A2, 12B2**) which are respectively provided on the opposite surfaces of the substrate and connected to the electrode (**12A**) on the one surface of the substrate and the electrode (**12B**) on the other surface of said substrate, equivalent to input and output terminals of said CR composite circuit, and which are respectively provided with discharge end portions (**12A2***a*, **12B2***a*) arranged to confront each other through a predetermined gap (G) along the surfaces of said substrate, said substrate (**11**) being formed with an opening (**15**) at a position equivalent to the gap (G) between said two discharge electrodes.

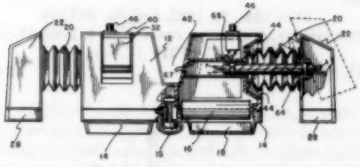


4,443,831

LIGHT MEANS AND METHOD OF LIGHTING

Timothy D. Godfrey, and Rodger L. Smith, both of P.O. Box 605, Wichita, Kans. 67201

Filed May 9, 1983, Ser. No. 492,900
Int. Cl.³ B60Q *1/00*
U.S. Cl. 362—80 **9 Claims**



1. A portable dual auxiliary lighting means generally mounted behind the inside interior rear view mirror with a support post of an automobile, or the like, comprising a case means;

battery means situated within said case means;

a pair of light housing for securing and housing a pair of light bulb;

adjustably positionable means interattaching said light housing to said case means;

a related circuitry means engaging said battery means to said light bulb, said circuitry being substantially housed within said case means and including at least one switch for closing the related circuitry between said battery means and said light bulb;

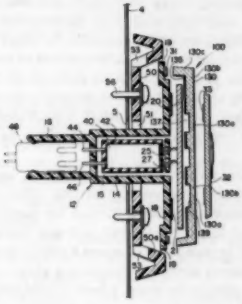
and a fastener means positioned on said case means for securing the lighting means behind said rear view mirror, said battery means is a plurality of same, said adjustably positionable means is bellows with one of same for each of said light housings; a related circuitry means engaging the battery means to each of the light bulbs; and said fastening means comprises at least one spring biased clip means situated on said case means for clamping over the top of the rear view mirror to hold the lighting means against the back of the mirror.

4,443,832

SELF-ILLUMINATING ORNAMENT FOR VEHICLES

Hiroshi Kanamori, Yokohama; Takehiro Shigeya, Kamakura, and Nobumasa Aoki, Tokyo, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama City and Marui Industrial Co., Ltd., Tokyo, both of, Japan

Filed Sep. 15, 1982, Ser. No. 418,428
Claims priority, application Japan, Sep. 29, 1981, 56-152967; Dec. 9, 1981, 56-183171[U]
Int. Cl.³ F21V *9/16*
U.S. Cl. 362—84 **15 Claims**



1. An ornament for a vehicle to indicate a decorative or identifying mark, the ornament comprising:

a base attachable to an outer part of the vehicle body;

an electric lamp supported by said base; and

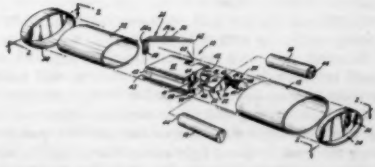
a cover which is a one-piece member formed of a transparent material and is attached to said base so as to entirely cover said lamp with a space therebetween, the inner side of said cover facing said lamp being processed such that said cover has a first area, which is in a pattern corresponding to the shape of said mark and allows light rays emitted by said lamp to pass therethrough but in the daylight prevents recognition of said lamp therethrough from the outside, and a second area which is contiguous to said first area and does not allow said light rays to pass therethrough, said inner side of said cover being recessed only in said first area to reduce the thickness of said cover in said first area.

4,443,833

FLASHLIGHT

S. Harry Fazzina, 8411 Widener Rd., Wyndmoor, Pa. 19118

Filed Mar. 7, 1983, Ser. No. 473,080
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—189 **3 Claims**



1. A flashlight comprising: a housing having

(a) a generally flexible side wall;

(b) a first end wall;

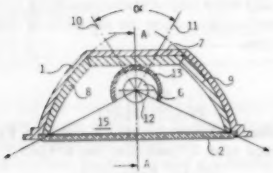
(c) a second end wall having an off-center opening therein;
(d) an insulating, battery retaining member including resilient arm members adapted for retaining a pair of batteries having exposed conductive surfaces;
(e) one of said batteries projects beyond the end of said battery retaining member adjacent said one end of said housing and wherein the other of said batteries projects beyond said battery retaining means adjacent said other end of said housing, and wherein said projecting portions are equal, whereby said positive post and the flat end wall of said other of said batteries path lie the same plane;
(f) a light bulb at the end of said housing adjacent said second end wall with a portion of said light bulb extending through said off-center opening, said light bulb being electrically connected to one of said batteries;
(g) a conductive member having an elbow-shaped configuration with one leg being frictionally retained between the conductive surface of said other battery and its adjacent battery retaining member and with the other leg being in fixed contact with the conductive socket of said light bulb, and is further provided with an aperture in the leg adjacent the lamp socket adapted to rotatably receive and take up said socket, which bulb itself is provided with a spiralled ridge configuration to threadedly engage said aperture; and
(h) a conductive switch member having one leg frictionally retained on said positive post of said other battery, said switch member including a second leg portion extending between said flexible side wall and said battery retaining member and terminating adjacent a cutout portion of said battery retaining member, exposing a conductive portion of the other of said batteries, whereby said switch member completes a circuit between said batteries and said light bulb when compression is applied to the flexible side wall.

4,443,834

INTERIOR LIGHTING FOR VEHICLES WITH ROTATABLE MASK

Heinz Schäfer, Geseke, and Wilhelm Schrader, Erwitte, both of Fed. Rep. of Germany, assignors to Westälische Metall Industrie KG Hueck & Co., Lippstad, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,703
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1981, 3113964
Int. Cl.³ F21V 7/14
U.S. Cl. 362—280 **11 Claims**



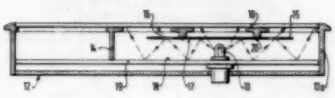
1. Interior light for vehicles comprising: a concave reflector behind a bulb; an opaque mask with a cutout that can be variably positioned in the path of light rays from the bulb to alter their direction, said mask being positioned in the path of the rays and between the bulb and the reflector; said reflector comprising at least two paraboloid reflecting surfaces with optical axes intersecting at a predetermined angle; said cutout in the mask having a size, shape, and variable position for allowing the mask to direct light onto either reflecting surface while blocking light from impinging upon the other paraboloidal surface, the interior light being also a reading light for persons in different seated positions whereby rays reflected by said paraboloid reflecting surfaces are parallel so that illuminated areas have uniform light intensity, said reflector being entirely maskable against light emanating from said bulb.

4,443,835

APPARATUS FOR CREATING AN EVEN ILLUMINATION OF A PLURALITY OF TITLE BLOCKS

Rolf Bräutigam, Markt; Jurgen Wesemeyer, Nuremberg, and Hartmut Zöbl, Furth, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 31, 1981, Ser. No. 297,826
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033096
Int. Cl.³ F21V 7/00
U.S. Cl. 362—300 **16 Claims**



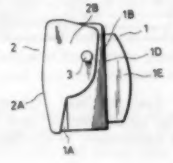
1. Apparatus for evenly illuminating a plurality of title blocks (11) on a front panel of a housing, comprising
a light source (13) within the housing; and
diaphragm means (15) positioned between said front panel and said light source, said diaphragm means having apertures (16) arranged in the region of said title blocks (11), the free area of said apertures being positioned for illumination of respectively associated title blocks and increasing in accordance with the size of the title blocks associated with any specific opening as well as with the distance from said light source (13) to the respective title blocks to provide for uniform illumination of said title blocks.

4,443,836

AUXILIARY HEAD LAMP DEVICE FOR CAR EQUIPPED WITH COVER

Tatsuo Horiuchi, and Kazushige Kiyota, both of Tatebayashi, Japan, assignors to Ushio Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1982, Ser. No. 363,514
Claims priority, application Japan, Feb. 8, 1982, 57-17579
Int. Cl.³ F21V 17/00
U.S. Cl. 362—375 **8 Claims**



1. An auxiliary lamp device equipped with a cover for a vehicle, comprising: an auxiliary lamp for a vehicle, said lamp including an enclosed casing and a lens attached to said casing, said auxiliary lamp attachable to a body portion of a vehicle; a cover rotatably mounted on said casing for opening and closing the lens of said auxiliary lamp; and a cover driving mechanism for moving said cover from a closed position where said cover covers the lens of said auxiliary lamp to an open position where said cover uncovers the lens of said auxiliary lamp; said cover driving mechanism comprising: a resilient member for urging said cover for movement in the direction from said closed position to said open position; an operation member fixed integrally with said cover and moving integrally with said cover; a detent member engaging with said operation

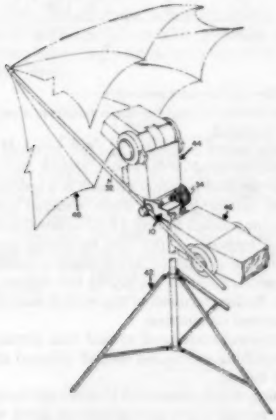
member and restricting movement of said cover against said resilient member when said cover is at said closed position; an electrically operated operation start driving means for disengaging said detent member from said operation member when a current is applied thereto; and an automatic switch mechanism for stopping the current flow to said operation start driving means by movement of said operation member fixed integrally with said cover when said cover moves from said closed position.

4,443,837

MOUNTING FIXTURE FOR A CAMERA LIGHT STAND

Albert Migliori, and Stephen D. Northup, both of Santa Fe, N. Mex., assignors to Philip M. Casady and Melvin A. Pfaelzer, both of Santa Fe, N. Mex.

Filed Sep. 29, 1982, Ser. No. 427,978
Int. Cl.³ F21V *21/00*
U.S. Cl. 362—396 10 Claims



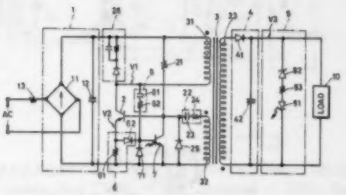
1. A mounting fixture for a photographic light stand, comprising a generally rectangular solid fixture body having first and second flash lamp shoe brackets formed integrally thereon, said shoe brackets being oriented substantially orthogonal to one another, said fixture body further including an integral deflectable locking arm for clamping said fixture body to a post of a photographic light stand, said fixture body and said deflectable locking arm having coaxial bores, a locking bolt and associated nut means, said bolt extending through said bores for deflecting said arm to lock said fixture body to a post, said bolt having a threaded shaft and a cylindrical head with a transverse bore passing therethrough for receiving a shaft of a reflective light umbrella, a locking collar positioned on said bolt between said cylindrical head and said fixture body, said collar being generally tubular with a planar end surface bored to receive the shaft of said bolt, said collar having an inside diameter sized such that said collar closely receives said cylindrical head when said bolt is tightened, said collar further including a pair of semicircular recesses cut into the tubular end edge of said collar, said recesses being alignable with the bore through said head so as to permit an umbrella shaft to be inserted through said bore in said head and engaged by said collar, whereby upon tightening of said bolt said umbrella shaft is secured by said collar and said head.

4,443,838

REGULATED SINGLE-ENDED SELF OSCILLATING, DC-DC CONVERTER

Takeshi Yamada, Nagaokakyo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Nov. 30, 1981, Ser. No. 326,022
Claims priority, application Japan, Dec. 1, 1980, 55-169308
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—19 8 Claims



1. A switching regulator comprising:
an oscillator including a first transistor and a transformer having a primary winding connected to said transistor, a secondary winding and a positive feedback winding connected to said transistor,
a rectifying and smoothing circuit connected to said secondary winding,
excessive voltage detecting means for detecting that the output voltage of the rectifying and smoothing circuit has exceeded a predetermined value,
a second transistor connected to said first transistor for controlling the duration of conduction of the first transistor by detecting the excessive voltage, and
a positive feedback circuit connected between the collector of the first transistor and the base of the second transistor for stabilizing the oscillation of the oscillator.

4,443,839

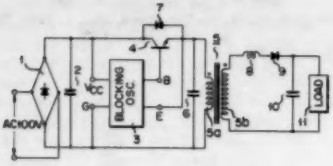
SINGLE ENDED, SEPARATELY DRIVEN, RESONANT DC-DC CONVERTER

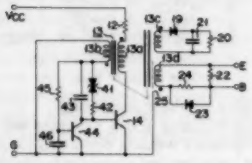
Toshihiro Onodera, Tokyo, and Youichi Masuda, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 10, 1981, Ser. No. 329,438
Claims priority, application Japan, Dec. 23, 1980, 55-182341; Dec. 26, 1980, 55-185812; Dec. 26, 1980, 55-185813
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—20 2 Claims

1. A DC-DC converter comprising:
an ideal transformer with a leakage inductance and an exciting inductance in the primary side;
a capacitor connected in parallel with said exciting inductance of said ideal transformer;
switching means of the voltage resonance type including a switching element connected between said primary side of said ideal transformer and an input DC power source, said switching means periodically interrupting a voltage of said DC power source;
a blocking oscillating circuit with output stabilizing means which directly receives a voltage of said input DC power source and controls said switching means by the oscillating output; and
means for rectifying and smoothing the output from the secondary side of said ideal transformer and for supplying the rectified and smoothed output to a load;
wherein said blocking oscillating circuit comprises,
a switching transistor,
a transformer including a primary winding connected in series to said switching transistor and excited by the voltage of said input DC power supply source, a first secondary winding for applying a feedback signal to the base

electrode of said switching transistor, a second secondary winding for applying a control signal for intermittently interrupting said switching means, and a third secondary winding for setting a pulse stop period of the pulse to be





obtained at the output end of said switching element of said switching means, and

electrostatic shielding means for electrostatically shielding said second secondary winding from the remaining winding of said transformer.

4,443,840

DC/DC CONVERTER

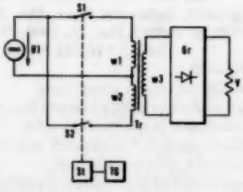
Klaus H. Geissler, Backnang, and Karl-Heinz Hübner, Leutenbach, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 426,162

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142304

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—24 **3 Claims**



1. A direct voltage converter comprising: a transformer having primary and secondary winding means; first and second electronic switches connected to said primary winding means; rectifier means connecting said secondary winding means to a load; and switch control means connected to said electronic switches for closing said switches periodically and in alternation at a selected repetition rate in response to pulses produced by a clock pulse generator, for applying a direct voltage across said primary winding means and periodically reversing the polarity of that direct voltage across said primary winding means, said switch control means comprising means for producing a gap period between the turn-off of one said switch and the turn-on of the other said switch, during which both said switches are open and said primary winding means are disconnected from the direct voltage, said producing means providing a gap period duration selected to correspond to the time required for voltage in said secondary winding means to automatically reverse polarity at the inherent resonant frequency of said transformer and rectifier means.

4,443,841

NEUTRAL-POINT-CLAMPED PWM INVERTER

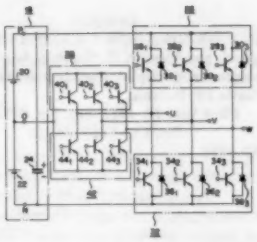
Wataru Mikami, 2-19-3, Yurigaoka, Ninomiya-cho, Naka-gun, Kanagawa-ken; Kazuo Nagatake, 43 Aza Denjiyama, Narumi-cho, Midori-ku, Nagoya-shi, and Takuo Ono, 2-8-1, Azamino, Midori-ku, Yokohama-shi, all of Japan

Filed Feb. 17, 1981, Ser. No. 234,915

Claims priority, application Japan, Feb. 15, 1980, 55-18148

Int. Cl.³ H02M *1/12, 7/537*

U.S. Cl. 363—41 **7 Claims**



1. An inverter device comprising:

a DC power source circuit having a positive, a negative and a neutral terminal;

first switching means connected at a first terminal thereof to the positive terminal of the power source circuit for supplying the positive terminal voltage at a second terminal of the first switching means when rendered conductive;

second switching means having a first terminal connected to the second terminal of the first switching means and a second terminal connected to the negative terminal of the power source circuit for supplying the negative terminal voltage at the first terminal of the second switching means when rendered conductive;

an output terminal connected to said first terminal of said second switching means and second terminal of said first switching means;

third switching means connected between the neutral terminal of the power source circuit and the point where said first and second switching means are connected for operating in interlock with the first switching means and supplying the voltage of the neutral terminal through said output terminal when rendered conductive; and

fourth switching means connected in parallel to the third switching means for operating in interlock with the second switching means and supplying the voltage of the neutral terminal through said output terminal when rendered conductive.

4,443,842

INVERTER FIRING CONTROL WITH COMPENSATION FOR VARIABLE SWITCHING DELAY

Ralph D. Jessee, Lima, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 5, 1982, Ser. No. 355,073

Int. Cl.³ H02M *7/537, 1/12*

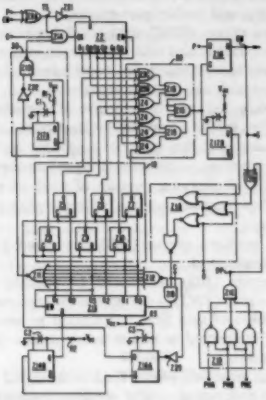
U.S. Cl. 363—41 **14 Claims**

1. A pole switch firing control circuit for controlling a pulse width modulated inverter in accordance with a reference pulse signal, said control circuit comprising:

means for measuring switching time of the pole switch for a given pulse in a first output cycle of the inverter;

means for subtracting said switching time from a preselected time interval to obtain a delay time; and

means for generating a control signal for initiating a pole switch switching sequence for a second pulse corresponding to said given pulse in a second output cycle, succeeding said first output cycle, wherein initiation of said pole switching sequence occurs after a period equal to said delay time following a transition point of a pulse in said reference signal.

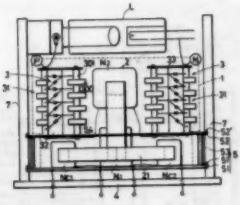


4,443,843

DC HIGH VOLTAGE GENERATOR FOR A DENTAL X-RAY PHOTOGRAPHING APPARATUS

Toshiaki Ikeda, Yahata; Shuhei Furuichi, Shiga, and Masakazu Suzuki, Shin Nakamachi, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jun. 26, 1981, Ser. No. 277,888
Claims priority, application Japan, Jun. 27, 1980, 55-88056
Int. Cl.³ H02M *3/18*; H05K *7/00*
U.S. Cl. 363—59 **1 Claim**



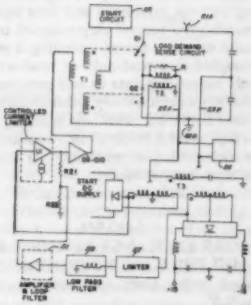
1. A DC voltage generator for a dental X-ray photographing apparatus wherein a high voltage transformer circuit comprises capacitor type multiple boosting circuits which are connected to a secondary side of a variable magnetic leak transformer with a reverse T-shaped core and in which a plurality of mutually insulated capacitors are vertically laminated via diodes, said boosting circuits being disposed vertically facing with each other on a right and left sides of said secondary winding of said variable magnetic transformer, said high voltage transformer circuit being removably mounted on a double base plate comprising a base plate on which said transformer is placed with its control winding side directed downward, and a base plate in which a window is provided at a center and the secondary winding projects through the window so that said capacitor type multiple boosting circuits can be loaded and unloaded and the high voltage transformer circuit can be loaded into and unloaded from the base plate, the X-ray tube being disposed superjacent control windings of said variable leakage transformer with the secondary windings of said variable magnetic leak transformer in between said X-ray tube and said control windings and positive high voltage obtained by upward multiple boosting of one of said capacitor type multiple boosting circuits and negative high voltage obtained by downward multiple boosting of another boosting circuit with reference to the ground potential are respectively supplied to positive and negative terminals of said X-ray tube.

4,443,844

HIGH FREQUENCY POWER SWITCHING CIRCUIT

Alan G. Grace, San Carlos, Calif., assignor to Efflo Incorporated, Fort Worth, Tex.

Filed Aug. 19, 1981, Ser. No. 294,367
Int. Cl.³ H02M *7/537*
U.S. Cl. 363—132 **34 Claims**



1. A high frequency power switching circuit for converting a DC voltage to a high frequency voltage, comprising:

two power switching means coupled together,

means for connecting a DC voltage across said two power switching means,

a saturable timing transformer having a primary winding and two secondary windings,

one of said secondary windings being coupled to one of said power switching means for driving said one power switching means,

the other of said secondary windings being coupled to the other of said power switching means for driving said other power switching means,

an output lead coupled to the junction of said two power switching means, and

amplifier means having an input coupled to said output lead and an output coupled to said primary winding of said timing transformer,

said amplifier means and said timing transformer being coupled in a positive feedback loop whereby said two power switching means, said amplifier means and said timing transformer form an oscillator for alternately switching said two power switching means on and off to convert said DC voltage to a high frequency voltage at said output lead,

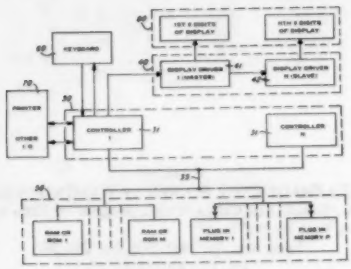
said amplifier means being operated as a limiter to insure that the going off power switching means is completely off before the going on transistor power switching means is on.

4,443,845

MEMORY SYSTEM HAVING A COMMON INTERFACE

Stephen P. Hamilton, Midland, and Arthur C. Hunter, Lubbock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 26, 1980, Ser. No. 163,023
Int. Cl.³ G06F *13/06*
U.S. Cl. 364—200 **6 Claims**



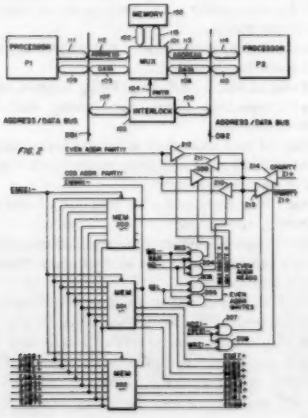
1. A multichip date processing system comprising:
processor means on a first chip for sequentially producing or receiving address, command and data signals,
memory means on a second chip coupled to said processor means, said memory means including a program counter means coupled to a read-only or read-write memory for selectively outputting data to said processor and a plurality of conductors electrically interconnecting said processor on said first chip with said memory means on said second chip, at least some of said conductors being common for transmitting or receiving said address, command and data signals sequentially.

4,443,846

DUAL PORT EXCHANGE MEMORY BETWEEN MULTIPLE MICROPROCESSORS

Ralph L. Adcock, Irvine, Calif., assignor to Sperry Corporation, New York, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,299
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **3 Claims**



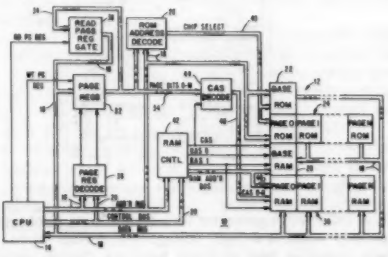
1. A computing system comprising,
first (P1) processor means,
second (P2) processor means,
one of said first and second processor means, operates upon words which are twice as long as the words operated upon by the other processor means,
multiplexer means (101),
first bus means (DB1) connected between said first processor means and said multiplexer means,
second bus means (DB2) connected between said second processor means and said multiplexer means,
said first and second bus means carry information in the form of data signals and address signals,
the address signal carrying portion of one of said first and second bus means comprises bidirectional signal transmission means and the other of said first and second bus means comprises unidirectional signal transmission means,
the data signal carrying portion of each of said first and second bus means comprises bidirectional signal transmission means,
dedicated memory means (100) connected to said multiplexer means, and
control means (103) connected to selectively supply a pointer signal (PNTR) to said multiplexer means to determine which of said first and second processor means is actively connected to said memory means via said multiplexer means,
said control means supplies a read/write signal which determines that the read or the write operation is to be performed when a processor means is connected to said memory means via said multiplexer means in response to said pointer signal,
said control means further connected to selectively supply a select signal to said multiplexer such that one of said processor means is actively connected directly to the other processor means via said multiplexer means.

4,443,847

PAGE ADDRESSING MECHANISM

David J. Bradley; Lewis C. Eggebrecht, both of Boca Raton; Dennis S. Gibbs, Lighthouse Point, and Donald J. Kostuch, Boca Raton, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1981, Ser. No. 231,653
Int. Cl.³ G06F *9/30*
U.S. Cl. 364—200 **13 Claims**



1. A data addressing system for addressing data storage means comprising:
processor means which provides control signals and address signals, said control signals manifesting a data movement operation to be performed and said address signals defining addresses within a confined address space,
addressable memory means for being addressed within said confined addressable space, said memory means including both read only memory addressable in a first portion of said confined addressable space and random access memory addressable in a second portion of said confined addressable space, said read only memory and random access memory being divided into an unpaged part and a plurality of paged parts, such that the address signals

directly address said unpaged parts and page signals enable one of said paged parts to be addressed by said address signals;

a plurality of selectable page register means, each for storing a code, one of said page register means being selected at any time to provide said page signals as manifesting said stored code; and

page register selection means responsive to said control signals and selected address signals defining said address space portions for selecting one of said page register means wherein said page register means includes first, second and third page register means, said first page register being selected to provide said page signals whenever a read data operation occurs with respect to said read only memory, said second page register being selected to provide said page signals whenever a read data operation occurs with respect to said random access memory, and said third page register being selected to provide said page signals whenever a write data operation occurs with respect to said random access memory.

4,443,848

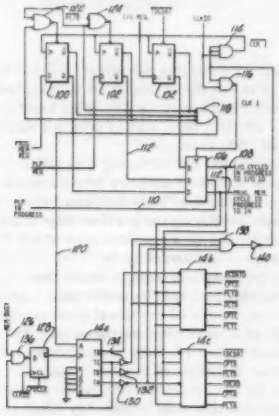
TWO-LEVEL PRIORITY CIRCUIT

John T. Gehman, Needham, Mass., assignor to Nixdorf Computer Corporation, Burlington, Mass.

Continuation-in-part of Ser. No. 73,597, Sep. 10, 1979, Pat. No. 4,310,880. This application May 4, 1981, Ser. No. 260,141

Int. Cl.³ G06F *9/38*

U.S. Cl. 364—200 **1 Claim**



1. In a digital computer of the type having an instruction address sequencer, clock means for generating CLK 1 and $\overline{\text{CLK 1}}$ signals, and a memory which receives access requests from a plurality of requesting sources: arbitration means connected to receive CLK 1 and $\overline{\text{CLK 1}}$ and said memory access requests to arbitrate between effectively concurrent requests in synchronism with CLK 1, said arbitration means comprising a first tier connected to receive and store for processing the memory access requests and a second tier connected to the first tier to receive and store for processing the selected requests, the clock means being connected to the arbitration means are such that CLK 1 operates the first tier and $\overline{\text{CLK 1}}$ operates the second tier, the first tier comprising a plurality of bistable circuits equal in number to the number of requests to be arbitrated, each of said circuits having a data input connected to receive a request, a reset input adapted to be connected to higher priority circuits, a clock input connected to receive CLK 1, and an output connected to a data input of a device in the second tier.

4,443,849

ERROR RECOVERY SYSTEM OF A MULTI-PROCESSOR SYSTEM FOR RECOVERING AN ERROR BY TRANSFERRING STATUS SINGALS FROM ONE PROCESSOR TO ANOTHER WITHOUT USE OF A MAIN MEMORY

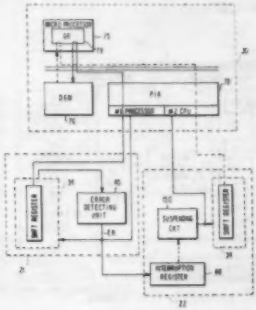
Hiroyuki Ohwada, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,132

Claims priority, application Japan, Oct. 9, 1980, 55-141323

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—200 **6 Claims**



1. An error recovery system for use in combination with an electronic digital computer system comprising a main memory for storing a plurality of programs and a plurality of processors for processing said programs, each program comprising a succession of instructions, each processor comprising executing means for fetching selected ones of said instructions and for executing each of the selected instructions, during a first period of time during which retry of execution of the selected instruction is allowable and a second period of time during which retry of execution of said selected instruction is not allowable, to produce masses of information, monitoring means for monitoring operation of said executing means to produce an error signal when an error is detected during execution of a particular one of the selected instructions and to suspend execution of the particular instruction, and retry enable signal producing means operatively coupled to said monitoring means for producing a retry enable signal during said first period of time during which retry of execution of each of said selected instructions is allowable, said executing means including register means responsive to said error signal for keeping, as status signals, a mass of information resulting from execution of the particular instruction, said error recovery system being energized on occurrence of the error in a first of said processors to make a second of said processors take over execution of the particular instruction, wherein the improvement comprises:

storage means coupled to the retry enable signal producing means and the register means of each processor and responsive to the retry enable signal produced in the first processor for taking over for storage therein the status signals kept in the first processor directly therefrom without being sent through said main memory;

the second processor comprising:

suspending means energized upon occurrence of the error in the first processor for suspending operation of the executing means of the second processor after completion of execution of one of the instructions fetched by the second processor that is currently executed; and

ready signal producing means coupled to said suspending means for producing a ready signal after completion of execution of said one of the instructions;

said error recovery system further comprising:

delivering means responsive to the retry enable signal produced in the first processor and said ready signal for

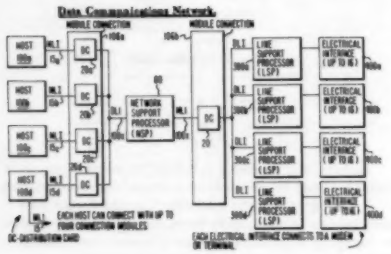
delivering the status signals directly from said storage means to the register means of the second processor without passing through said main memory, thereby, to enable the second processor to take over execution of said particular instruction.

4,443,850

INTERFACE CIRCUIT FOR SUBSYSTEM CONTROLLER

Craig W. Harris, El Toro, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 1, 1981, Ser. No. 326,423
Int. Cl.[3] G06F *15/16, 15/20*
U.S. Cl. 364—200 **10 Claims**


Data Communications Network
MODULE CONNECTION
MODULE CONNECTION
HOST
DC
NETWORK SUPPORT PROCESSOR (NSP)
LINE SUPPORT PROCESSOR (LSP)
ELECTRICAL INTERFACE (UP TO 16)
EACH HOST CAN CONNECT WITH UP TO FOUR CONNECTION MODULES
DC DISTRIBUTION CARD
EACH ELECTRICAL INTERFACE CONNECTS TO A MODEM OR TERMINAL

1. In a data communications network where a peripheral-controller controls data transfer operations between main memory of a main host computer and with a plurality of line communications processors connected to remote peripheral terminals, said peripheral-controller including master and slave processor means which include individual memory-controller means and a commonly shared memory bank, and an interface circuit which provides connection channels to said main host computer and said line communications processors, and wherein said master and slave processor means uses placement (PUT) and retrieval (GET) instructions to control operation of said interface circuit and to initiate the movement of data between said main host computer and said line communications processor after initiation instructions from said main host computer, the interface circuit for said peripheral-controller comprising:

(a) a first (DLI) interface logic means for controlling synchronous data transfers between said shared memory bank and said main memory of said host computer, said first interface logic means including:

(a1) PROM sequencing means, initiated by said master processor means, and functioning to operate a data shifting circuit for bidirectional movement of data words between said main host computer and said shared memory bank;

(a2) a data shifting circuit having connection means to said host computer and to said shared memory bank;

(b) a second (MLI) interface logic means for controlling asynchronous data transfers between said shared memory bank and a selected line communications processor, said second interface logic means including:

(b1) control logic means, operating under instructions from said master processor means, and functioning to transfer data between said shared memory bank and said selected line communications processor, wherein said control logic means operates to select the transfer of data in either

(i) a direct memory access mode, or

(ii) a non-direct memory access mode;

(b2) first channel means for transfer of each individual data word, during said non-direct memory access mode, between said shared memory bank and said selected line communications processor, by a single individual instruction from said master processor means to said control logic

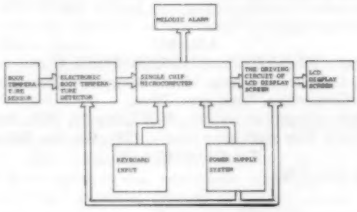
(b3) second channel means for transfer of blocks of data words, during said direct memory access mode, between said shared memory bank and said selected line communications processor by a single individual direct memory access instruction from said master processor means to said control logic means.

4,443,851

AUTOMATIC RECORDING, INDICATING AND PREDICTING DEVICE FOR GYNECOPHYSIOLOGICAL CYCLES

Kin-Yuan Lin, 14, Nung 33, Lane 269, Li Shan St., Nei Hu, Taipei, Taiwan

Continuation of Ser. No. 165,807, Jul. 3, 1980, abandoned. This application Jul. 29, 1982, Ser. No. 403,037
Int. Cl.[3] A61B *5/04*
U.S. Cl. 364—415 **1 Claim**



1. A device for analyzing menstrual cycles comprising:

(a) a sensor means for sensing body temperature;

(b) keyboard input means for providing input data representative of the date, time, start of prior menstrual cycles and abnormal body conditions;

(c) microprocessor means having data processing and storage means including memory storage means for storing data representative of body temperature, including abnormal conditions during the previous days in a current menstrual cycle, and data representative of the first day of at least one prior menstrual cycle;

said data processing and storage means also including calendar means for providing calendar data, including at least data representative of the actual date and the safe period between two successive menstruations, for providing a continuous curve of body temperature versus date to provide an indication of the anticipated start of ovulation prior to the start thereof while, in the case of any abnormal condition that may appreciably affect the body temperature, comprising fever factors that occur during the sensing of the body temperature, data representative of any said abnormal condition is fed through the keyboard to instruct the microprocessor to label the date automatically and, in so doing, to provide an indicating flag of abnormal conditions that will correspond to the date thereof;

said microprocessor means also coupled to said sensor and said keyboard means for receiving inputs therefrom and for processing said inputs to provide output data representative of body temperature as a function of date, whereby said device predicts the period of gestation and next menstrual cycle for women, including women having long menstrual cycles, as a function of said calendar data, said body temperature and said first day of at least one prior menstrual cycle;

(d) graphic display means having flag means coupled to said keyboard input means by said microprocessor means for receiving data and displaying said data in a continuous curve of body temperature versus date to provide an indication of the same, the abnormal conditions and the

anticipated start of ovulation prior to the start thereof, the graphic display means becoming operative to indicate an abnormal condition on a specific date when instructed to do so by data input at the keyboard, whereby said device detects, records, analyzes and plots body temperature change and abnormal conditions in conjunction with a rhythmic method for measuring, recording and storing the data of the continuously changing body temperature for providing an automatic recording, indicating and predicting device for gynecophysiological cycles.

4,443,852

CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

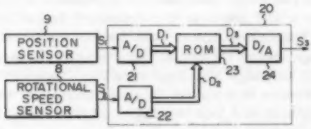
Masayoshi Kobayashi, Kawagoe; Hidekazu Oshizawa, Kumagaya; Kenji Okamoto, Higashimatsuyama, and Akira Sekiguchi, Saitama, all of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1980, Ser. No. 209,967

Claims priority, application Japan, Nov. 29, 1979, 54-165354[U]

Int. Cl.³ G05D *13/62;* **F02B** *3/00;* **B60K** *41/08*

U.S. Cl. 364—431.03 **7 Claims**



7. A fuel injection apparatus for feeding fuel to a diesel engine equipped with a torque converter controllable according to the amount of accelerator operation, comprising:

means for producing a position signal indicating the position of an element for controlling the fuel injection amount provided within said fuel injecting apparatus;

means for producing a rotational speed signal indicating the rotational speed of the diesel engine;

means for determining the theoretical degree of depression of the accelerator according to the design specifications by using said position signal and said rotational speed signal on the basis of design data indicating the relationship between the position of said controlling element and the rotational speed, and;

means for applying a signal output from determining means to said torque converter.

4,443,853

OPTICAL DIGITAL SERVO CONTROL SYSTEM

Joseph R. Maciolek, Milford, and Edmond D. Diamond, Huntington, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 247,417, Mar. 25, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 485,137

Int. Cl.³ B64C *13/50, 19/00;* **G05D** *1/08*

U.S. Cl. 364—434 **2 Claims**

1. A closed-loop servo actuator system comprising:

a mechanical actuator;

electric signal responsive means for operating said mechanical actuator;

input means for providing a sensible manifestation of a command for said actuator; and

electric signal processing means interconnected between said input means and said electrically responsive means for operating said actuator;

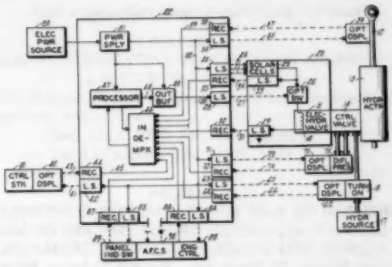
wherein the improvement comprises:

a control means for said actuator;

feedback means disposed for response to said actuator to provide an optical digital signal to said electric signal processing means indicative of the movement of said actuator;

said electric signal processing means comprising means to provide optical power to said feedback means, said control means, and said input means;

said input means comprising an optical transducer responsive to said sensible manifestation for providing a digital optical signal to said electric signal processing means indicative of said sensible manifestation;



said control means comprising means to provide electric power in response to said optical power provided thereto from said electric signal processing means and optically responsive means for selectively applying said electric power to said electric signal responsive means; and

said signal processing means providing, in response to corresponding ones of said optical signals provided thereto, optical signals to said optically responsive means.

4,443,854

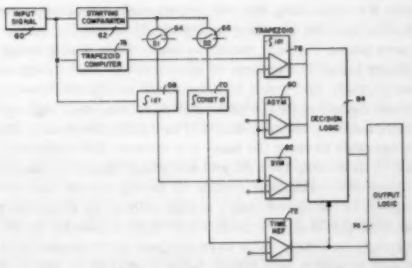
CURRENT SENSOR RESPONSIVE TO SYMMETRICAL AND ASYMMETRICAL CURRENTS AND CURRENT LIMITING PROTECTOR UTILIZING SAME

Herbert M. Pflanz, and Albert B. Lester, both of Westwood, Mass., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 8, 1981, Ser. No. 271,580

Int. Cl.³ H02H *3/26*

U.S. Cl. 364—483 **8 Claims**



1. A fault current sensor responsive to excess current comprising

first means for determining symmetry and asymmetry of a current wave,

second means for determining a measure of the root mean square of said current wave, said first means for determining symmetry and asymmetry of a current wave comprising integration means for integrating said current wave over a period of time after current exceeds a preset level, a trapezoid computation means for computing a trapezoidal area defined by said line current at the beginning of said time period and at the end of said time period, and

means for comparing the output of said integration means and the output of said trapezoid computation means,

comparison means operably connected with said second means for comparing said measure of said current wave with first and second reference potential levels for a symmetrical line wave and an assymetrical line wave, respectively, and

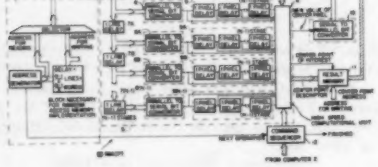
logic means operably connected with said first means and said comparison means and responsive to symmetry and asymmetry of said line wave and to said comparison means for generating a signal indicating a fault.

4,443,855

METHOD OF AND APPARATUS FOR CONTROLLING ROBOTIC EQUIPMENT WITH THE AID OF MASK ALGORITHM IMAGE PROCESSING TECHNIQUES

Robert Bishop, 77 Pond Ave., Brookline, Mass. 02146, and Richard Damon, 305 Memorial Dr., Cambridge, Mass. 02139

Filed May 6, 1981, Ser. No. 260,892
Int. Cl.³ G06F *15/46*; H04N *7/18*
U.S. Cl. 364—513 **7 Claims**



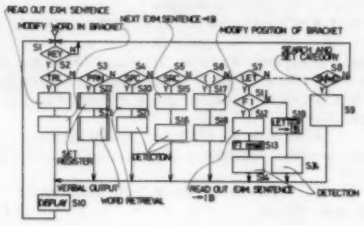
1. Robotic apparatus having, in combination, a robotic mechanism to operate on points of interest in a field; computer means for controlling the robotic mechanism; an image sensor operable to scan the field and provide an analog image of objects within the field; means to convert the analog image to a binary image in the form of binary words each comprising several pixels, said pixels forming multiple adjacent rows; and a mask algorithm image processor that comprises high-speed picture memory means connected to receive the binary words and operable to store the same in a manner that maintains the spatial relationship thereof, and analyzing means for analyzing contiguous overlapping groups of binary bits in successive iterations of the stored binary image, each group comprising at least nine pixels in a three-by-three matrix, thereby to determine the new binary value to be assigned to the center pixel of the group, which new binary value is applied to said center pixel to update the same, said analyzing means including a programmable memory operable to store in real time the present binary value to the center pixel until it is no longer needed in the present iteration and also to apply the new value as memory update in real time; and result memory means that receives information from the analyzing means only as to said points of interest and that stores said information which is in the form of address information and description information with respect to said points of interest to provide an output that is connected as input to the computer in order to cause the robotic mechanism to operate upon said points of interest of objects in real time.

4,443,856

ELECTRONIC TRANSLATOR FOR MODIFYING AND SPEAKING OUT SENTENCE

Shintaro Hashimoto, Ikoma; Masafumi Morimoto, Yamatokoriyama; Tosaku Nakanishi, Nara; Hideo Yoshida, Kashihara, and Shigenobu Yanagiuchi, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 10, 1981, Ser. No. 282,238
Claims priority, application Japan, Jul. 18, 1980, 55-99458
Int. Cl.³ G10L *1/00*
U.S. Cl. 364—513.5 **6 Claims**



1. An electronic translator for translation of a desired sentence in a first language to a translated desired sentence in a second language different from the first comprising:

storage means for containing exemplary sentences in said first language and their associated translated exemplary sentences in a second language therein as well as stored words in said first language and their associated translation words;

means for selecting an exemplary sentence stored in said storage means, said desired sentence different from said exemplary sentence by one or more different words;

input means for introducing said different words from said desired sentence which correspond in location in said sentence to replacable words of said exemplary sentence;

means for translating said desired sentence to generate a translated desired sentence including,

means for addressing said storage means to recall said translated exemplary sentence,

means for searching said storage means and comprising each of said different words to said stored words contained therein,

means, monitoring said means for searching, for detecting a coincidence between one of said different words and one of said stored words and recalling its associated translation word from said memory means,

means for replacing each word in said translated exemplary sentence corresponding in meaning to a said replacable word in said examplary sentence with a said translation word to form a translated desired sentence;

voice memory means having synthetic speech representations of said translated desired sentence stored therein; and

voice synthesizer means responsive to said translation means and said voice memory means for producing a synthetic human speed representation of said translated desired sentence.

4,443,857

PROCESS FOR DETECTING THE MELODY FREQUENCY IN A SPEECH SIGNAL AND A DEVICE FOR IMPLEMENTING SAME

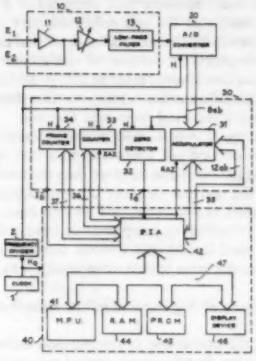
Alain Albarello, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Nov. 4, 1981, Ser. No. 318,135
Claims priority, application France, Nov. 7, 1980, 80 23881
Int. Cl.³ G10L *1/00*
U.S. Cl. 364—513.5 **10 Claims**

1. A process for detecting, in real time, the pitch frequency of a speech signal, comprising the steps of:

measuring a reduced set of data of said signal with said set comprising values of the energy in successive half-waves of said signal and values of the duration of said half-wave;

performing a procedure on said set of data with said procedure including an alternate acquisition phase for performing a first series of test whereby said energy values are compared with a first at least one predetermined value in order to confer an acquired character on said speech signal whenever said first at least one predetermined value is exceeded, and which then calculates a pitch period value, and wherein said procedure further involves a



holding phase for performing a second series of tests whereby said energy values which exceed said first at least one predetermined value are compared with a second at least one predetermined value in order to update said pitch period value;

repeating said second series of tests as long as said second at least one predetermined value is exceeded thereby maintaining said acquired character; and

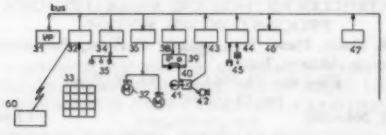
initiating a new acquisition phase when said acquired character is lost because said second at least one predetermined value has not been exceeded.

4,443,858

APPARATUS FOR READING MICROFICHES

Alain N. Piaton, Puteau, France, assignor to Anfor, Paris, France

Filed May 27, 1981, Ser. No. 267,282
Claims priority, application France, Jun. 2, 1980, 80 12197
Int. Cl.³ G06F *15/40*; G03B *23/08*
U.S. Cl. 364—518 **17 Claims**



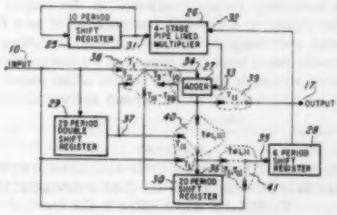
1. Apparatus for displaying microfiche data, comprising manually actuable means for actuation by a user to indicate successive desired display regions of at least one microfiche from a set, the regions bearing information which the user needs, a microfiche reader comprising mechanical means for defining the coordinates of the regions to be displayed, means for projecting and presenting the information in said regions, and control means for controlling said mechanical means and said projecting and presenting means, said control means comprising a microprocessor for processing data entered by said manually actuable means, data relating to the operation of the different components of the apparatus and data associated with the information borne by the different regions of the microfiche, characterized in that said control means comprises memory means for storing said data, said microprocessor (31) being responsive to said stored data for transmitting to the different elements (35,37,39) of the apparatus the instructions necessary for presenting the information sought and also complementary information, said projecting and presenting means having means adapted to present a decision tree within which the user can continue his search according to indications contained in said complementary information.

4,443,859

SPEECH ANALYSIS CIRCUITS USING AN INVERSE LATTICE NETWORK

Richard H. Wiggins, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 6, 1981, Ser. No. 280,742
Int. Cl.³ G06F *15/31*; G10L *1/00*
U.S. Cl. 364—724 **17 Claims**



1. A speech analysis device implementing an inverse lattice filter, said speech analysis device comprising:

input means for receiving digital signals repesentative of speech;

memory means storing a plurality of digital speech parameters representative of filter coefficients;

a single multiplier means only, said multiplier means having first and second inputs and an output;

said memory means being coupled to said first input of said multiplier means for providing digital speech parameters thereto;

a single adder means only, said adder means having first and second inputs and an output;

the output of said multiplier means being coupled to said first input of said adder means;

said input means being adapted to be coupled to said second input of said adder means;

first and second delay means respectively adapted to be coupled to the output of said adder means and to said input means;

a first feed-back loop adapted to connect the output of said first delay means to said second input of said adder means;

a second feed-back loop connecting the output of said second delay means to said second input of said multiplier means;

a third feed-back loop adapted to connect the output of said adder means to said second input of said adder means;

first sequentially operable switching means interposed between the output of said adder means and the input of said first delay means and between said input means and the input of said first delay means and sequentially positionable in at least a first switching position connecting the output of said adder means to said first delay means but disconnecting said input means from said first delay means, and a second switching position connecting said input means to said first delay means but disconnecting the output of said adder means from said first delay means;

second sequentially operable switching means interposed between the output of said adder means and the input of

said second delay means and between said input means and the input of said second delay means, said second delay means being serially arranged with respect to said first switching means, said second switching means being sequentially positionable in a first switching position connecting the input of said second delay means to the output of said adder means but disconnecting said input means from said second delay means, and a second switching position connecting said input means to said second delay means but disconnecting the output of said adder means from said second delay means;

third sequentially operable switching means interposed between said input means and said second input of said adder means and sequentially positionable in a plurality of switching positions to alternatively connect said input means to said second input of said adder means, to complete said third feed-back loop connecting the output of said adder means to said second input of said adder means, and to complete said first feed-back loop connecting the output of said first delay means to said second input of said adder means; and

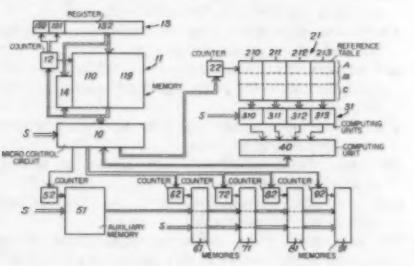
fourth switching means interposed in the output of said adder means at a position independent of said first and second switching means, said fourth switching means normally being open but closing at a predetermined time interval to enable the output of said adder means to provide an output signal of the speech analysis device.

4,443,860

SYSTEM FOR HI-SPEED COMPARISONS BETWEEN VARIABLE FORMAT INPUT DATA AND STORED TABULAR REFERENCE DATA

Jacques Vidalin, 12 rue du Palais des Guilhem, Montpellier, France (34000)

Filed Jun. 10, 1980, Ser. No. 158,318
Claims priority, application France, Jun. 19, 1979, 79 15701
Int. Cl.³ G06F *7/06, 7/22, 13/00*
U.S. Cl. 364—900 **6 Claims**



1. A method for processing information received from a file which includes data elements of different types, each data element consisting of a fixed or variable number of items of information, each item of information in a given data element having a different respective order, data elements of a first type being arranged in sequences which are identified by a data element of a second type, said method comprising the steps of:

(A) storing reference data elements in a table logically divided into horizontal zones and vertical columns, each horizontal zone storing one or more reference data elements which are of a same said type and which are to be simultaneously compared to a data element received from the file such that eah said horizontal zone is associated with reference data elements of a respective type, each reference data element consisting of a fixed or variable number of items of information, each item of information in a given reference data element having a different respective order, each reference data element being stored vertically in a respective vertical column of the horizontal zone in which it is located with each item of information of that reference data element being located in a respective line of that vertical column, and the vertical order of said horizontal zones following the order in which the data elements of types corresponding to said zones appear in said file;

(B) storing control information in a control memory which is logically divided into a plurality of lines, each line of said memory containing:

(1) first items of control information including: comparison control information identifying the type of comparison to be made between data elements of a same type received from said file and reference data elements of this type stored in a horizontal zone of said table, which zone corresponds to the line of the memory wherein said comparison control information is stored; and storage control information relating to the storage of the data elements received from said file; and

(2) second items of control informaton indentifying operations to be carried out when a comparison operation is completed between one or more data elements received from the file and one or more corresponding reference data elements in said table, said second items of control information including jump control information identifying the next line in said control memory and/or the next horizontal zone in said table which is to be jumped to;

(C) sequentially receiving items of information from said file; and

(D) executing the operations of comparison and/or storage identified by the first items of control information stored in a first line of said control memory, jumping to the next line of said control memory identified by the jump control information stored in said first line of said control memory and then executing the operations identified by the items of control information stored in said next line of said control memory, each operation of comparison being carried out by simultaneously comparing each item of information of a received data element with each item of information of the same order of each reference data element of the same type as the received data element, said step of executing operations of comparison and/or storage being carried out without interrupting the receipt of data elements from said file and without intermediate storage of the received data elements and each item of information received from the file initializing the execution of the operations controlled by the control information contained in said control memory and relating to this item of information.

4,443,861

COMBINED MODE SUPERVISORY PROGRAM-PANEL CONTROLLER METHOD AND APPARATUS FOR A PROCESS CONTROL SYSTEM

Billy R. Slater, Plano, Tex., assignor to Forney Engineering Company, Addison, Tex.

Filed Apr. 13, 1981, Ser. No. 253,964
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—900 **5 Claims**

1. A control system for effecting control over an industrial process, said control system comprising:

a plurality of remotely located process controllers interconnected to one another through a common communications link, some of said controllers each connected to at least one controlled device for effecting control thereover, some of said controllers each connected to at least one sensor for receiving sensed information therefrom;

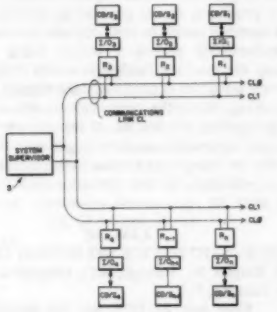
a control system supervisory unit connected to said communications link, said system supervisory unit transmitting and receiving information in coded form to and from said remotely located controllers to effect control over the industrial process;

said system supervisory unit including means for interacting

with a system operator including information entry means and information display means;

said system supervisory unit including data processing means containing instruction sets to define a plurality of functional blocks, each block capable of receiving one or more input values, operable to perform a different function on the input values, and produce an output value determined by the input values and the function performed thereon, said data processing means containing instruction sets to define a plurality of process controlling program steps of an assembly language program, said data entry means operable to apply information signals of a first set to said data processing means specifying selected ones of said functional blocks and specifying the source of the input values to the selected functional blocks to thereby determine a first control system architecture for said remotely located controllers, said data entry means being operable to apply information signals of a second set to said data processing means to select a sequence of said program steps and parameters for said program steps to define a second control system architecture for said remotely located controllers, said data processing means being operable to cause said display means to display information indicating what selections with respect to said functional blocks are to be made and have been made by the information signals of said first set and to display information indicating the selections with respect to said program steps to be made and that have been made by the information signals of said second set,

said control system including means to effect control over said industrial process in accordance with said first and second control system architecture determined by the information signals generated by said data entry means.



4,443,862

ULTRASONIC SIGNAL APPARATUS WITH MULTIPLEXER FOR SELECTIVELY LOADING VIDEO LINE SEGMENTS INTO A PARALLEL-PARTITIONED IMAGE STORE

Klaus Buchner, Kleinsendelbach, and Ulrich Saugeon, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,723

Claims priority, application Fed. Rep. of Germany, May 2, 1980, 3017027

Int. Cl.³ G06F *15/42*

U.S. Cl. 364—900 **21 Claims**

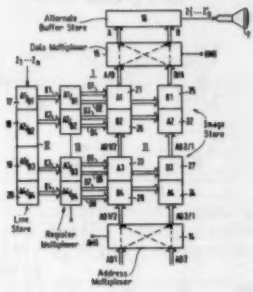
1. Apparatus for the storage of successive digital electric signals representing successive video lines, in particular corresponding to ultrasonic images,

said apparatus comprising:

a line store having a capacity for storing a sequence of digital electric signals representing a video line, said line store comprising a set of line store sections each storing a segment of said sequence of digital electric signals,

an image store having respective image store sections each with a respective individual input data channel leading to the individual image store section, and having signal output means for the supply of image signals at a video display rate, and

a register multiplexer having respective inputs connected with the respective line store sections of said line store, and having respective outputs connected with respective individual input data channels of respective individual image store sections, said register multiplexer in a multiplex cycle loading respective segments representing a video line stored by the set of line store sections in parallel into respective image store sections, and in a series of multiplex cycles loading segments into the image store representing a video image.



4,443,863

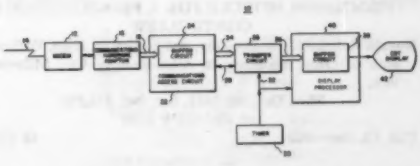
TIMER DRIVEN DISPLAY UPDATING

Dennis G. Busch; Robert J. Grafe, and Gary E. Leikam, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 16, 1981, Ser. No. 274,351

Int. Cl.³ G06F *3/14*

U.S. Cl. 364—900 **17 Claims**



1. In a data communications system having at least one data transmit terminal and one data receive terminal, said data receive terminal having display means for displaying received data on a character by character basis, the improvement comprising:

first storage means for storing said received data;

a timer for establishing fixed time intervals;

transfer means connected to said timer for transferring said received data from said first storage means at the end of each of said fixed time intervals; and

second storage means for receiving and storing said received data as transferred by said transfer means from said first storage means;

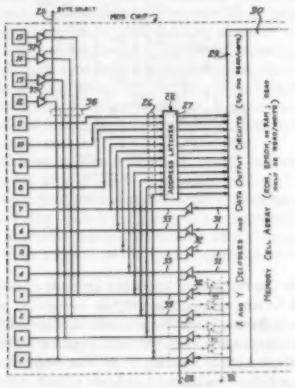
said display means connected to said second storage means and being activated at the end of each of said fixed time intervals for simultaneously displaying on a display terminal all data stored in said second storage means.

4,443,864

MEMORY SYSTEM FOR MICROPROCESSOR WITH MULTIPLEXED ADDRESS/DATA BUS

David J. McElroy, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 83,122, Oct. 9, 1979, Pat. No. 4,306,298. This application Oct. 13, 1981, Ser. No. 310,014
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 **16 Claims**



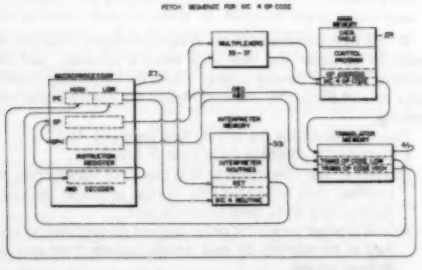
1. A memory device comprising memory means having an M-bit address input and an 8-bit data output, where M is an integer greater than eight, the memory means accessing eight data bits to said output in response to an M-bit address on said input, the device having sixteen address/data terminals, means connecting said 8-bit data output to a selected eight of said terminals, means connecting said M-bit address input to M of said terminals which include said selected eight of said terminals, and gate means selectively connecting certain ones of said terminals to inputs of said M-bit address input.

4,443,865

PROCESSOR MODULE FOR A PROGRAMMABLE CONTROLLER

Ronald E. Schultz, Willoughby, and Steven H. Rigg, Willowick, both of Ohio, assignors to Allen-Bradley Co., Milwaukee, Wis.

Filed Oct. 26, 1981, Ser. No. 314,596
Int. Cl.³ G06F *9/00*
U.S. Cl. 364—900 **16 Claims**



1. An improved processor for a programmable controller of the type having an I/O interface for connection to a plurality of I/O devices, wherein the processor has first memory means that stores data relating to the status of the I/O devices, wherein the processor also has means for coupling the first memory means and I/O interface enabling transfer of the status data between the first memory means and the I/O interface, and wherein the improvement in the processor comprises:

second memory means for storing user program instructions for operating on the status data, wherein each user program instruction includes a two-segment operation code;

third memory means for storing machine instructions organized in interpreter routines which are associated with corresponding operation codes for respective user program instructions, the third memory means also storing a machine fetch instruction for reading both segments of a selected one of the operation codes; and

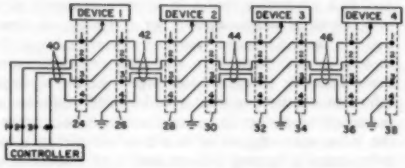
microelectronic processor means having a machine instruction pointer register coupled to the third memory means to generate address signals thereto, and having a stack pointer register that is coupled to the second memory means to generate address signals thereto, the microelectronic processor means generating address signals to the third memory means to read machine instructions, and the microelectronic processor means being responsive to reading the machine fetch instruction stored in the third memory means to generate address signals from the stack pointer register to the second memory means to read the segments of the selected one of the operation codes into its machine instruction pointer register and to thereafter execute the interpreter routine in the third memory means that is pointed to by that operation code.

4,443,866

AUTOMATIC DEVICE SELECTION CIRCUIT

Samuel G. Burgiss, Sr., Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,149
Int. Cl.³ G06F *3/00, 7/00*
U.S. Cl. 364—900 **4 Claims**



1. A device interconnecting system for automatically assigning a unit address to each device depending upon the position of the device in a chain of devices, said system comprising

control means having N terminals, said control means being capable of energizing any one or more of said N terminals,

N controlled devices, each having first and second sets of terminals, each of said sets of terminals having N terminals, each terminal in said first and second sets being designated by a different one of the numerals 1 through N, respectively, the first terminal of said first set of terminals being connected to the device with which said set is associated, each of the remaining of said first set of terminals of each device being connected to the next lower numbered terminal of the second set of terminals that is associated with the device,

N cables, each having N conductive leads therein, one of said cables being connected between said N controller terminals and a first one of said N controlled devices, and each of the remaining (N−1) of said cables being connected between the second set of terminals of a respective one of said N devices and the first set of terminals of the next adjacent one of said N devices, each of said cables having polarized terminations whereby a first lead in each cable is connected between the first terminal of the two sets of terminals to which that cable is connected, the Nth lead in each cable is connected between the Nth terminal

of the two sets of terminals to which that cable is connected, and each of the remaining leads in each cable is connected between corresponding terminals of the two sets of terminals to which that cable is connected,

whereby the first terminal of said control means becomes connected to the first controlled device in the chain of devices extending from said control means, and each of the second through the Nth terminals of said control means becomes connected to the respective one of the second through the Nth controlled devices in the chain of devices extending from said control means so that the unit address of each device is automatically determined in accordance with the position of that device in the chain of devices extending from said control means.

4,443,867

MAGNETIC BUBBLE STORE

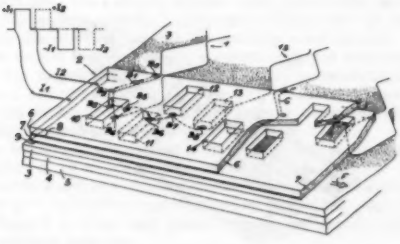
Mokhtar Boshra-Riad, Giza, Egypt; Jean-Marc Fedeli, Saint Egreve, France; Hubert Jouve, Biviers, France, and Daniel Mauduit, Rives sur Fure, France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 7, 1981, Ser. No. 251,760

Claims priority, application France, Apr. 18, 1980, 80 08765

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—19 **6 Claims**



1. A magnetic bubble store comprising:

a series of longitudinally oriented shift registers each having an access end,

at least one transversely oriented access contour register having a single access point corresponding to each access end of each longitudinally oriented shift register,

access means for applying electrical current to said access contour register to control the access to said longitudinally oriented shift registers,

means for producing displacement of the bubbles in the longitudinally oriented shift registers by applying a rotary magnetic field,

said longitudinally oriented shift registers comprising motifs defined by ion implantation in a magnetic garnet layer,

said access means comprising two conductive sheets superimposed on the magnetic garnet layer in the vicinity of the access ends of the longitudinally oriented shift registers, said sheets being insulated from one another and from the magnetic garnet and provided with openings arranged such that at least one of the sheets has openings in the vicinity of the access ends of the longitudinally oriented shift registers, the other openings of said sheets being positioned so as to forward the bubbles which have in this way obtained access to the longitudinally oriented shift registers to an access station or to other longitudinally oriented shift registers in the series.

4,443,868

SEMICONDUCTOR MEMORY DEVICE

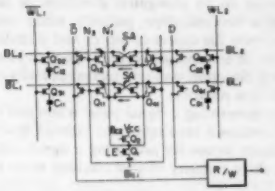
Yoshihiro Takemae, Yokohama, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 4, 1981, Ser. No. 318,004

Claims priority, application Japan, Nov. 4, 1980, 55-154811

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—205 **8 Claims**



1. A semiconductor memory device, comprising:

a plurality of pairs of bit lines, each pair of said bit lines being short circuited and precharged to a potential level before a read operation;

a plurality of word lines intersecting said bit lines;

a plurality of dynamic-type memory cells, each of said dynamic-type memory cells being operatively connected to one of said pairs of bit lines and one of said word lines;

a plurality of sense amplifiers, each of said sense amplifiers operatively connected to a pair of bit lines, each of said sense amplifiers having a terminal to activate the sense amplifier, and each for detecting the potential difference between each pair of said bit lines; and

a control line, operatively connected to said terminals and said bit lines and crossing both of the bit lines in each of said pairs of bit lines, for activating said sense amplifiers and being commonly used as a control line for short circuiting and precharging each of said pairs of bit lines.

4,443,869

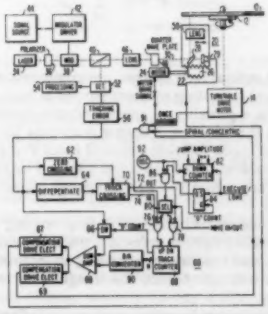
TRACK JUMP SERVO SYSTEM FOR DISC PLAYER

George J. Ammon, Medford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,356

Int. Cl.³ G11B *17/06*

U.S. Cl. 369—41 **7 Claims**



1. In an information playback system for use with a disc-shaped record medium having information stored along a plurality of successive, elongated tracks, each of said tracks being provided in a single rotation of said record medium, an apparatus comprising:

transducer means for detecting said information stored in said information tracks;

means for rotating said record medium;

means for providing a track jump signal representative of the number of tracks between first and second read positions wherein said first and second read positions correspond to said transducer means reading information recorded in first and second ones of said plurality of tracks respectively;

means for providing a tracking error signal having a first slope polarity when said transducer crosses over the center of one of said plurality of tracks in a first direction transverse to an elongated direction of said track and having a second slope polarity when said transducer crosses over the center of one of said plurality of tracks in a second direction, said second direction being opposite to said first direction, and said second polarity being opposite to said first polarity;

means for generating a signal pulse when said tracking error signal crosses a zero reference voltage level;

differentiator means for providing a signal output indicative of the slope polarity of said tracking error signal;

and

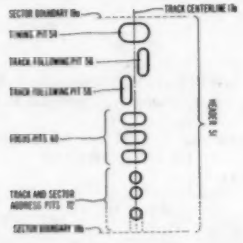
means responsive to said means for providing a track jump signal and responsive also to said generating means and said differentiator means for establishing radial relative motion between said transducer and said record medium such that said transducer means is relocated from said first read position to said second read position.

4,443,870

OPTICAL MEMORY SYSTEM PROVIDING TRACK FOLLOWING

Robert L. Hazel, Thousand Oaks, and Edward V. LaBudde, Newbury Park, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 15, 1981, Ser. No. 311,745
Int. Cl.³ G11B *7/00*
U.S. Cl. 369—44 **6 Claims**



1. In an optical data system, the combination comprising:

an optical recording medium having at least one track containing a plurality of spaced header recordings disposed along the track, each header recording including first and second track following optical holes elongated in a direction parallel to the track and disposed on opposite sides of the track center line in a staggered relationship along the track;

reading means including an optical reading radiation beam for reading optical holes in a track of said recording medium, said reading beam having an intensity such that the beam will not disturb the integrity of recorded optical holes;

means providing for relative movement of said beam along a track, the dimensions and locations of said track following holes being chosen in conjunction with the size of the reading beam so that traversal thereof by said beam produces a reflected beam which varies in a manner dependent upon the accuracy of positioning of said beam relative to the center of said track; and

track positioning means providing for relative movement of said beam transversely to a track;

said reading means including control means responsive to the reflected reading beam obtained when the reading beam traverses said track following optical holes for deriving a track following signal which when applied to said track positioning means acts to maintain the beam on the center line of a selected track;

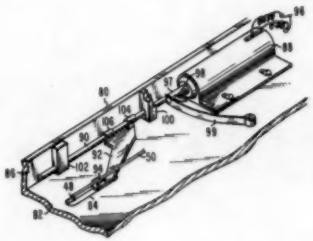
said control means including integrating means for deriving said track following signal for each header recording based upon the difference between the value obtained by integrating the reflected beam variations obtained as a result of the beam traversing the first track following hole of the header recording and the value obtained by integrating the reflected beam variations obtained as a result of traversing the second track following hole of the header recording.

4,443,871

STYLUS LOWERING, LIFTING AND CLEANING APPARATUS

Anil R. Dholakia, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 11, 1982, Ser. No. 338,379
Int. Cl.³ G11B *3/58*
U.S. Cl. 369—71 **6 Claims**



1. In a system for recovering information from a record medium, said system including a pickup arm having a stylus mounted at a first end thereof, said pickup arm being mounted in a radially translatory carriage, said carriage having an opening to permit said stylus to pass out of the confines of said carriage to make contact with said record medium during playback, the apparatus comprising:

end support means coupled to a second end of said pickup arm remote from said stylus for restraining said remote end against vertical translatory motion while allowing said first end to move vertically;

a cleaning pad;

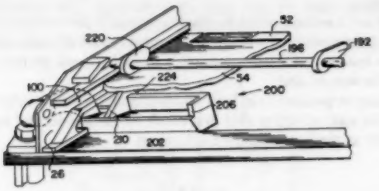
movable support means coupled to said cleaning pad and for supporting said cleaning pad in a position below said pickup arm whereby said cleaning pad supports said pickup arm; and

reciprocating drive means coupled to said movable support means for driving said movable support means in a generally longitudinal direction relative to said pickup arm whereby during motion of said reciprocating drive means towards said stylus said cleaning pad progressively raises said stylus and wipes said stylus in a first direction, and during motion of said reciprocating drive means away from said stylus said cleaning pad wipes said stylus in a second direction and lowers said stylus.

4,443,872
VIDEO DISC PLAYER HAVING CADDY LOCKOUT MECHANISM

Thomas F. Kirschner, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 3, 1982, Ser. No. 374,462
Int. Cl.³ G11B 1/00
U.S. Cl. 369—77.2 9 Claims



1. In a disc record player for use with a record caddy; said caddy consisting of a record retaining spine removably located within an outer sleeve; said retaining spine and an associated record forming a record/spine assembly; said player having an input slot through which said caddy is inserted along a path to load a record therein; said player retaining said record/spine assembly when said sleeve is extracted from said player after the insertion of a full caddy therein; wherein an empty sleeve is reinserted into said player to recapture said record/spine assembly; an apparatus comprising:

a lockout member yieldably mounted near said input slot in said player occupying a first position in said caddy insertion path, and a second position outside said caddy insertion path, respectively, in response to the presence of and the absence of a record/spine assembly in said player;

said lockout member having a square edge and a sloping edge respectively disposed substantially perpendicularly and non-perpendicularly with respect to said caddy insertion path when said lockout member is occupying said first position in said caddy insertion path;

the location of said sloping edge being such that the front edge of an empty sleeve, reinserted into said player to retrieve said record/spine assembly, engages said sloping edge of said lockout member, occupying said first position thereof, to deflect said lockout member out of said caddy insertion path; and

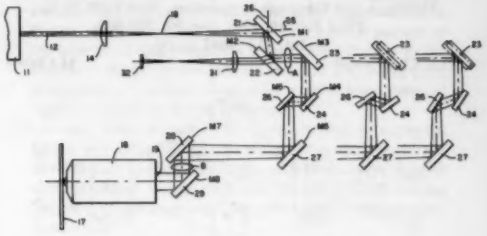
the location of said square edge being such that said square edge of said lockout member, disposed in said caddy insertion path in response to the presence of a record/spine assembly in said player; engages the front edge of a full caddy inserted into said player to preclude further caddy insertion.

4,443,873
OPTICAL SYSTEM FOR OPTICAL DISC READER

Erik W. Anthon, Santa Rosa, Calif., assignor to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Oct. 20, 1980, Ser. No. 198,477
Int. Cl.³ G11B 7/00
U.S. Cl. 369—110 17 Claims

1. In a reciprocal optical system for use in an optical disc reader of the type having a laser generating a laser beam and a detector for detecting the laser beam, means receiving the laser beam for forming an outgoing beam which travels to the video disc and is reflected thereby to provide a return beam to the detector, said means including at least one polarizing mirror which is impinged by both the outgoing and returning beams; said outgoing and returning beams being characterized by being orthogonally linearly polarized whereby said at least one polarizing mirror serves to separate the returning beam from the outgoing beam, said means including converting means upon which the outgoing beam and the returning beams impinge, said converting means introducing a 90° phase shift in the beams whereby the outgoing beam is converted from a linearly polarized beam to a circularly polarized beam and the returning beam is converted from a circularly polarized beam

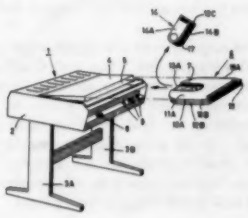


to a linearly polarized beam, said converting means including at least two mirrors in series providing a combined phase shift of 90°.

4,443,874
INFORMATION-DISC CASSETTE

Johannes Steenberg, Apeldoorn, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,449
Claims priority, application Netherlands, Nov. 11, 1981, 8105096
Int. Cl.³ B65D 85/30; G11B 23/02
U.S. Cl. 369—291 4 Claims



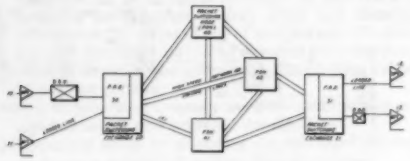
1. An information disc cartridge comprising a rotatble disc for storing information which is recorded thereon and/or reproduced therefrom by an information recording and/or reproducing apparatus and a disc enclosure having two major walls each on one side of said disc and a surrounding peripheral wall, each of said major walls having an elongated opening extending radially beyond the center of said disc so as to permit access to said disc by the apparatus for recording and/or reproducing information and to expose the central portion of said disc for engagement thereof by a disc drive member for rotating the disc, said cartridge further comprising a single, radially removable closing member for closing said openings in said major walls, said closing member having a first and second portion each configured to close a respective one of said openings and a peripheral portion disposed between and secured to said first and second portions so that when said closing member is fitted onto said enclosure, said first and second portions simultaneously close said openings in said two major walls, said closing member further having elastically compressible supporting means arranged on the sides of said closing member facing said disc so as to clamp the disc when the closing member has been fitted onto said enclosure.

4,443,875

APPARATUS AND METHODS OF CALL CLEARING IN A PACKET SWITCHED DATA COMMUNICATIONS NETWORK

Edmond J. Blausten, Union City, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 19, 1982, Ser. No. 350,505
Int. Cl.³ H04J 15/00
U.S. Cl. 370—60 14 Claims



1. In a packet-switched data communications system for providing bidirectional communication between a plurality of originating and destination data terminals, said terminals capable of being selectively connected together through a switching network associated with said system, with said originating terminals connected to a packet assembly and disassembly apparatus(PAD) for receiving data from said plurality of terminals and arranging said data into a high speed packet data stream for transmission of said stream to a destination PAD associated with said destination terminals, with said destination PAD operative to retrieve data packets from said stream indicative of data transmitted from any one of said originating terminals and to direct said data to a selected one of said destination terminals, the combination therewith of apparatus for providing a connection release when said originating terminal terminates said connection, comprising:

means responsive to said originating terminal providing a connection release to provide a signal indicative of said release,

timing means responsive to said signal to provide a predetermined delay manifesting a time period sufficient to assure the transmission of data from said originating to said destination terminal, and

means responsive to said predetermined delay having elapsed to provide a clear request signal to said packet switched data communications system, whereby said connection will be released by said system only after the elapse of said predetermined time period.

4,443,876

FAST PARITY GENERATION FOR FIND LOW ORDER ZERO CIRCUIT

Ying-Wah Ng, Lisle, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 31, 1981, Ser. No. 298,079
Int. Cl.³ G06F 11/00
U.S. Cl. 371—49 8 Claims

1. Apparatus for generating an overall parity indication for a positional address of the lowest order zero appearing on a plurality of inputs, said apparatus comprising

means responsive to signal states on a first plurality of the inputs for generating

at least a first result bit having a state representing parity of the positional address of a lowest order zero appearing in said first plurality of the inputs and at least a first activity bit having a state indicating whether said first plurality of inputs has a lowest order zero appearing therein,

means responsive to a second plurality of inputs for generating

at least a second result bit having a state representing parity of the positional address with respect to all of the inputs of a lowest order zero appearing in said second plurality of the inputs, and

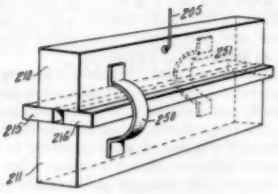
means responsive to at least said first activity bit for selecting the state of either said first result bit or said second result bit as the overall parity indication.

4,443,877

UNIFORMLY EXCITED RF WAVEGUIDE LASER

Peter P. Chenausky, Avon, and Leon A. Newman, South Windsor, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 1, 1982, Ser. No. 344,702
Int. Cl.³ H01S 3/09
U.S. Cl. 372—38 3 Claims



1. A radio frequency-excited gas laser comprising:

an optical resonant cavity having an axis passing therethrough and first and second electrodes disposed on opposite sides thereof and a lasing gas therein, said optical cavity having a cavity capacitance;

radio frequency means having an output impedance and being connected to said electrodes at a single feed point for establishing a radio frequency electric discharge of a predetermined driving frequency through said lasing gas, whereby optical radiation is resonated in said optical cavity, said discharge having a discharge resistance in parallel with said cavity capacitance, forming a cavity impedance that is a complex number;

a plurality of inductive elements having a predetermined cavity inductance connected between said electrodes in parallel with said discharge resistance and cavity capacitance to form an electrical resonant circuit having a complex RLC impedance and a predetermined resonant frequency; and

an input impedance circuit connected to at least one of said electrodes and to said radio frequency means, said input impedance circuit having a complex impedance the imaginary part of which has a predetermined relationship to the imaginary part of said cavity impedance at said driving frequency; characterized in that:

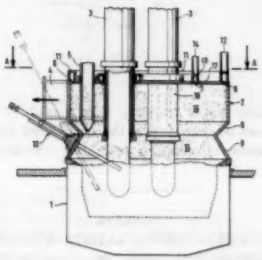
said plurality of inductive elements includes a first set having at least one inductive element disposed between said electrodes a first predetermined distance along said axis from a first end of said waveguide and a second set having at least one inductive element disposed betwen said electrodes a second predetermined distance along said axis from a second end of said waveguide opposite said first end.

4,443,878

METHOD OF MIXING A HOT FURNACE GAS WITH ANOTHER GAS BEFORE THE REMOVAL OF THE FURNACE GAS FROM THE FURNACE AND A HOOD THEREFORE

Frans H. Tuovinen, Ulvila; Bengt J. F. Norrman, Helsinki, both of Finland, and Risto M. Heikkilä, Haparanda, Sweden, assignors to Outokumpu Oy, Outokumpu, Finland

Filed Jun. 8, 1981, Ser. No. 271,648
Claims priority, application Finland, Jun. 19, 1980, 801983
Int. Cl.³ F27D 7/00
U.S. Cl. 373—9 15 Claims



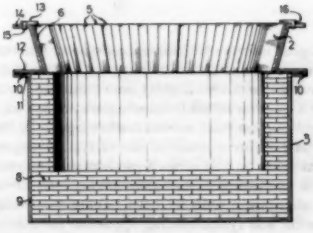
8. A cylindrical hood for mixing a hot furnace gas with a second gas before the furnace gas is discharged from a furnace which is open at that end which is intended to adjoin the gas space of the furnace, comprising an outlet pipe mounted tangentially to the side wall of the hood for hot gases treated in the hood, and inlets in the circumference of the cover at the opposite end of the hood for feeding the second gas into the hood along its walls and substantially countercurrently in relation to the hot gases coming from the opposite, open end of the hood.

4,443,879

ELECTROTHERMICAL FURNACE

Harald Krogsrud, Gjettum, Norway, assignor to Elkem a/s, Oslo, Norway

Continuation of Ser. No. 232,427, Feb. 9, 1981, abandoned. This application May 23, 1983, Ser. No. 496,334
Claims priority, application Norway, Feb. 21, 1980, 800466
Int. Cl.³ F27D 1/04
U.S. Cl. 373—71 6 Claims



1. In an electric smelting furnace, a furnace pot divided into upper and lower sections with the said sections being rotatable with respect to each other, the upper furnace pot comprising:

(a) a peripheral portion in the shape of a truncated cone with the wide portion of the truncated cone at the top thereof;

(b) a circumferential flange extending radially outward from the top of the peripheral portion in a substantially horizontal direction;

(c) a plurality of engaging means positioned about the top of the circumferential flange;

(d) a plurality of refractory lining plates covering the interior of said peripheral portion, each said lining plate being tapered to facilitate easy removal and having a radial dimension at its top greater than the radial dimension at its bottom, each said lining plate covering a radial portion of the interior of said peripheral portion from the top to the bottom of the peripheral portion and each said lining plate comprising a backing plate with a refractory material rigidly secured on the face thereof;

(e) at least some of said lining plates having an engaging flange extending radially outward from the top of the backing plate in substantially the same direction as the said circumferential flange; each said engaging flange having engaging means positioned on the bottom of the engaging flange; and

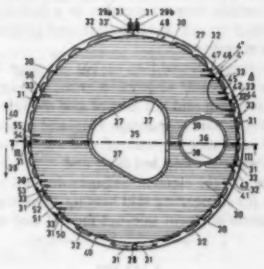
(f) the engaging means of the engaging flange engaging the engaging means of the circumferential flange in easily removable relationship.

4,443,880

LIQUID-COOLED COVER FOR ARC FURNACES

Karl Bühler, Nussbaumen, and Karl Oldani, Baden, both of Switzerland, assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland

Filed Jan. 24, 1983, Ser. No. 460,301
Claims priority, application Switzerland, Jan. 29, 1982, 553/82
Int. Cl.³ F27D 1/02, 1/12
U.S. Cl. 373—74 21 Claims



1. A liquid cooled cover for an electric furnace having a tipping direction, comprising:

a cover member having a peripheral cover ring serving as a cooling liquid distributing conduit, said cover member at least partially constructed of a fireproof construction material; and

cooling means disposed in said cover member for cooling said cover member, comprising,

plural cooling pipes horizontally disposed in said cover member perpendicular to said tipping direction, said cooling pipes spaced at a predetermined distance from each other and embedded in said fireproof construction material thereby to reinforce said fire proof construction material,

said cooling pipes connected by groups in series wherein respective groups have inlets and outlets in communication with said cooling liquid distributing conduit, and

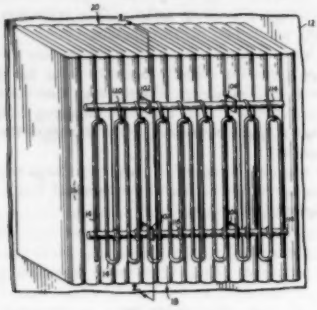
said cover member having at least one inlet and at least one outlet by which cooling liquid is exclusively supplied and removed to and from said cooling liquid distributing conduit.

4,443,881

SUSPENSION SYSTEM FOR ELECTRIC HEATING ELEMENTS

Donald R. Northcutt, 7345 Brittany, Shawnee Mission, Kans. 66203

Filed Jun. 1, 1982, Ser. No. 383,478
Int. Cl.³ F27D *11/02*; H05B *3/06*
U.S. Cl. 373—130 **15 Claims**



1. For use with an attachment system for affixing an insulation module to a furnace wall with said attachment system having at least one module support member therein, a suspension system for supporting a furnace heating element array adjacent the hot face of said module comprising:

first and second laterally spaced-apart suspension arms each having first and second longitudinally spaced-apart ends therein;

means for pivotally mounting said suspension arm first ends to said module support member in a manner to preclude interference by said module with said pivotal movement;

a cross bar member;

means for mounting said cross bar member between said second ends of said suspension arms, said cross bar member transversing said hot face of said module upon pivotal movement of said suspension arms and concurrent movement of said second ends of said suspension arms to a position adjacent said hot face; and

at least one hanger element engageable with said cross bar member for suspending said heating elements therefrom in said position adjacent said hot face of said module.

4,443,882

SINGLE TERMINAL NEGATIVE CAPACITANCE GENERATOR FOR RESPONSE TIME ENHANCEMENT

Robert M. Rolfe, Summit, and Masakazu Shoji, Warren, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1981, Ser. No. 333,400
Int. Cl.³ H04L *25/08*; H03H *11/48*
U.S. Cl. 375—36 **2 Claims**

2. A digital system comprising:

a digital transmitter having an MOS a field effect output transistor coupled to an output terminal thereof which has a capacitance associated therewith;

a digital receiver having an input terminal which has a capacitance associated therewith;

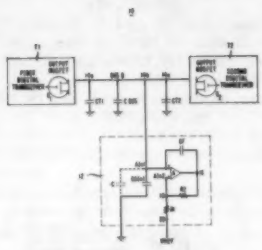
a data bus conductor having two ends and having a capacitance associated therewith and being coupled by one end to the output terminal of the transmitter and being coupled by the other end to the input terminal of the receiver;

an amplifier having a first input terminal and having an output terminal;

capacitor means having first and second terminals coupled to the input terminal and output terminal of the amplifier, respectively;

only the first input terminal of the amplifier being coupled to the data bus conductor;

the amplifier has a gain of approximately two or greater; and



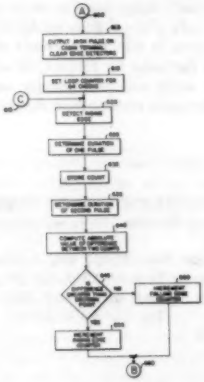
the amplifier has a response time which is approximately two times or greater less than a desired response time of information transmitted from the transmitter to the receiver.

4,443,883

DATA SYNCHRONIZATION APPARATUS

Michael F. Berger, Fort Worth, Tex., assignor to Tandy Corporation, Fort Worth, Tex.

Filed Sep. 21, 1981, Ser. No. 304,265
Int. Cl.³ G08C *25/00*; G06F *3/00*; H04L *7/00*; G11B *5/06*
U.S. Cl. 375—116 **23 Claims**



1. In a digital information processing system wherein digital information is encoded by an encoding waveform in a series of bit cells having one of two distinct time durations, each bit cell containing a portion of said encoding waveform and the inverse of said portion, said waveform having signal transitions of positive and negative polarity, said system having means for inserting into said bit cell series a predetermined synchronization pattern consisting of bit cells having one of said time durations, alternating with bit cells having the other of said time durations, and synchronizing apparatus for detecting cell boundaries in said bit cell series and in the inversion of said series comprising,

means responsive to said encoding waveform for timing at least two time durations occurring between successive pairs of signal transitions of the same polarity,

means responsive to timed durations of portions of said synchronization pattern for computing the difference of said time durations, and

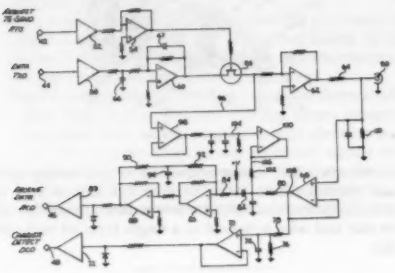
means responsive to said difference for locating said bit cell boundaries.

4,443,884

DATA LINE INTERFACE

Richard L. Swarz, Encino, Calif., assignor to Protocol Computers, Inc., Woodland Hills, Calif.

Filed Mar. 18, 1982, Ser. No. 359,576
Int. Cl.[3] H04L 5/14
U.S. Cl. 375—121 7 Claims



1. An interface comprising
first means for coupling to a coaxial cable,
second means for coupling to an RS-232 data line to receive data coupled to said second means for transmission on a coaxial cable,
third means for coupling to an RS-232 request to send line,
fourth means coupled to said first means for coupling data received from a coaxial cable to an RS-232 receive data line,
said third means being responsive to a signal on an RS-232 request to send line to couple said second means to said first means, whereby data received on an RS-232 data line will be coupled to a coaxial cable in response thereto,
said interface further having signal means coupled to said fourth means, and responsive to a data signal received by said second means and coupled to said first means, said signal means being a means for providing a signal to said fourth means to prevent the data signal coupled from said second means to said first means for transmission on a coaxial cable from being coupled to said RS-232 receive data line, whereby said fourth means will couple data received from a coaxial cable to an RS-232 data line independent of the simultaneous transmission of data to a coaxial cable by said interface.

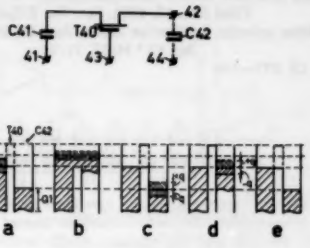
4,443,885

CHARGE TRANSFER METHOD AND DEVICE FOR CARRYING OUT THE METHOD

Arthur H. M. van Roermund, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 138,027, Apr. 7, 1980, abandoned. This application Sep. 28, 1982, Ser. No. 425,148
Claims priority, application Netherlands, Apr. 17, 1979, 7902968
Int. Cl.[3] G11C 19/28; H01L 29/78; H03K 3/353
U.S. Cl. 377—57 53 Claims

1. A method of transferring a signal charge from a first capacitance having an initial reference charge to a first point via a transistor circuit which exhibits a first threshold level, at least during said transfer to the first point, said signal charge being within a range of values such as to either add to or subtract from said initial reference charge on said first capacitance, and comprising a first phase in which the transistor circuit is biased such that charge transfer from the first point to the first capacitance is effected in such a way that the first capacitance is charged to at least said threshold level from said first point, and a second phase in which the transistor circuit is



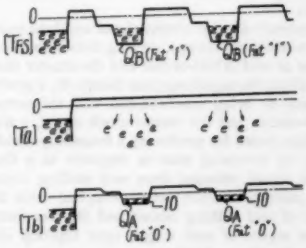
biased such that the first capacitance is discharged to said threshold level towards the first point.

4,443,886

CHARGE TRANSFER DEVICE IMAGER WITH BIAS CHARGE

Hiroyuki Matsumoto, Atsugi; Motoaki Abe, Hiratsuka, and Tetsuo Ando, Ebina, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 5, 1981, Ser. No. 318,436
Claims priority, application Japan, Nov. 7, 1980, 55-157437
Int. Cl.[3] G11C 19/28; H01L 29/78
U.S. Cl. 377—58 2 Claims

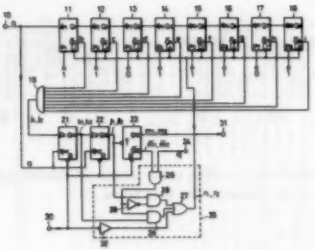


1. In a charge transfer device in which a plurality of electrodes are located on an insulating layer on a semiconductor substrate and an input portion and a transfer portion are provided, said charge transfer device, comprising:
(a) means for introducing a predetermined amount of charge determined by a potential applied to the input portion into a portion beneath a predetermined electrode while driving an electrode on the transfer portion;
(b) means for applying such a potential to all of said plurality of electrodes that surface areas beneath said electrodes each become an accumulation state to thereby inject all of charge into said substrate;
(c) means for applying a potential to said electrodes after a predetermined period of time to partially catch injected charge beneath said electrodes and to use caught charge as a bias charge.

4,443,887
FREQUENCY-DIVIDING CIRCUIT

Takami Shiramizu, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 12, 1981, Ser. No. 272,831
Claims priority, application Japan, Jun. 16, 1980, 55-81041
Int. Cl.³ H03K 21/36
U.S. Cl. 377—110 7 Claims



1. A frequency-dividing circuit comprising:

asynchronous counter means having a plurality of one-half frequency-dividers connected in series in a plurality of stages in which a master clock signal is applied to an input terminal of the initial stage, for asynchronously producing output signals of each one-half frequency-dividers, said asynchronous counter means being set with a preset data n (n is an integer) which is preset according to a desired frequency-dividing ratio when applied with a load pulse;

an AND-circuit for detecting the coincidence of a plurality of outputs supplied from said asynchronous counter means; and

frequency-divided output signal and load pulse generation means supplied with said master clock signal and an output signal of said AND-circuit, for generating a frequency-divided output signal and a load pulse, said frequency-divided output signal and load pulse generation means supplying a load pulse to said asynchronous counter means,

said frequency-divided output signal and load pulse generation means comprising a shifting circuit supplied with an output of said AND-circuit and the master clock signal, for shifting the signal supplied thereto by a predetermined quantity by being synchronized with the output of said AND-circuit and the master clock signal, a trigger-type flip-flop circuit for producing a frequency-divided output signal by reversing state in response to a final shifted output signal obtained from said shifting circuit, and a load pulse generation circuit supplied with the output signal of said shifting circuit and the frequency-divided output signal of said trigger-type flip-flop circuit, for producing the load pulse,

said shifting circuit having a first shift register supplied with the output of said AND-circuit and the master clock signal, and a second shift register supplied with an output of said first shift register and the master clock signal,

said trigger-type flip-flop circuit being supplied with an output of said second shift register.

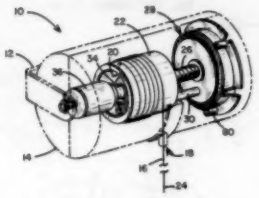
4,443,888
SID MONITOR

James W. Cutter, Hollister, Calif., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.

Filed Mar. 29, 1982, Ser. No. 362,808
Int. Cl.³ G03B 41/16; G01B 5/02
U.S. Cl. 378—151 9 Claims

1. In a continuous source to image distance monitor for use in self-adjusting X-ray equipment utilizing a housing having an aperture fixed therein for receiving a distance measuring wire maintained in tension by a takeup spring, the improvement in combination therewith comprising:

a self traversing, smooth-surfaced constant-diameter takeup cylinder receiving a tension-maintaining torque through

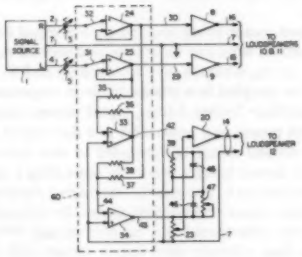


an eccentric link means connected to said takeup spring and constrained to move in a helical motion past said housing aperture as said wire moves through said aperture so that said wire is wound in a single layer on said cylinder.

4,443,889
ACOUSTIC APPARATUS AND METHOD

Donald E. Norgaard, Mountain View, Calif., assignor to Nortech Laboratories Ltd., San Francisco, Calif.

Filed Apr. 21, 1980, Ser. No. 142,131
Int. Cl.³ H04M 1/00
U.S. Cl. 381—24 4 Claims



1. The method of processing two signal voltages representing respective left and right stereophonic channels to produce a third signal voltage linearly related to an instantaneous algebraic difference between said two signal voltages, comprising in sequence:

reversing polarity of one of said two signal voltages to produce a reverse-polarity replica thereof;

summing current proportional to said reverse-polarity replica with current proportional to another one of said two signal voltages; and

providing a circuit path for resulting current sum through a common impedance to produce said third signal voltage thereacross.

4,443,890
OPTICAL-CONNECTION DIRECT-LIGHT MODULATION INFORMATION TRANSMISSION SYSTEM WITH A PASSBAND EXTENDED TOWARDS THE LOW FREQUENCIES AND CONTINUOUS WAVES

Grégoire Eumurian, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 1, 1981, Ser. No. 326,203
Claims priority, application France, Dec. 2, 1980, 80 25560
Int. Cl.³ H04B 9/00
U.S. Cl. 455—613 8 Claims

1. A direct-light modulation information transmission system comprising:

optical emission means having an output emitting diode for converting electrical signals to be transmitted into optical signals by direct modulation;

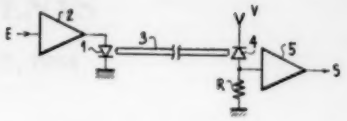
an optical connection for transmission of the said optical signals;

optical receiver means having an input photodiode for converting conversely said transmitted optical signals into electrical signals; and

means to prevent signal deformations which may result from temperature junction of said respective diodes, so as to extend the passband of the system to low frequencies and continuous waves, said means comprising:

first filtering means for avoiding non-linear thermal effects from said diodes, said first filtering means comprising high-pass filter means, coupled to said emission means, for reducing the level of said electrical signals whose frequency is lower than a predetermined low-frequency value, and first low-pass filter means, coupled to said receiver means, and having a reverse transfer function of said high-pass filter, for reestablishing the level of said low frequency electrical signals, and

second filtering means for compensating linear thermal effects from said diodes, said second filtering means



comprising at least one second low-pass filter means, coupled to said receiver means, for compensating the linear thermal effects produced by said emitting diode on low-frequency electrical signals passing through said high-pass filter.

DESIGN PATENTS

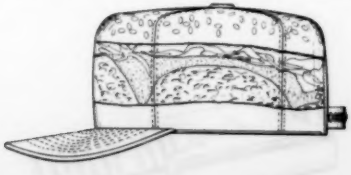
GRANTED APR. 17, 1984

ERRATA

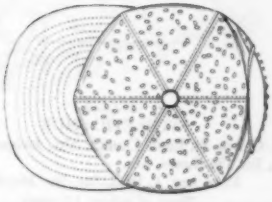
For CLASS	See PATENT NO.
D07–311	273,495

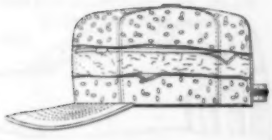
273,434
JEANS
Minnie Galbreath, 810 N. Hickory Ave., Compton, Calif. 90220
Filed Dec. 28, 1981, Ser. No. 334,702
Term of patent 14 years
U.S. Cl. D2—28

273,435
CAP
Charles J. Lipschutz, Louisville, Ky., assignor to Louisville Manufacturing Company, Inc., Louisville, Ky.
Division of Ser. No. 113,134, Jan. 17, 1980, Pat. No. Des. 267,285, which is a continuation-in-part of Ser. No. 946,955, Sep. 29, 1978, abandoned. This application Oct. 8, 1981, Ser. No. 309,832
Term of patent 14 years
U.S. Cl. D2—248



273,436
CAP
Charles J. Lipschutz, Louisville, Ky., assignor to Louisville Manufacturing Company, Inc., Louisville, Ky.
Division of Ser. No. 113,134, Jan. 17, 1980, Pat. No. Des. 267,285, which is a continuation-in-part of Ser. No. 946,955, Sep. 29, 1978, abandoned. This application Oct. 8, 1981, Ser. No. 309,833
Term of patent 14 years
U.S. Cl. D2—248

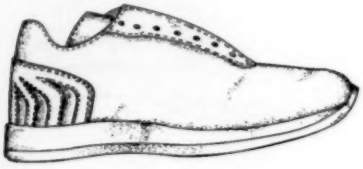




273,437
SPORT SHOE
Noboru Kohno, Nishinomiya, Japan, assignor to Mizuno Corporation, Osaka, Japan
Filed Nov. 19, 1981, Ser. No. 323,136
Claims priority, application Japan, May 20, 1981, 56-21796
Term of patent 14 years
U.S. Cl. D2—309

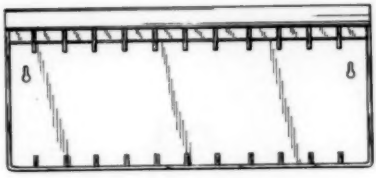
273,438
ATHLETIC SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Apr. 1, 1982, Ser. No. 364,489
Term of patent 14 years
U.S. Cl. D2—309

273,439
ATHLETIC SHOE
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A., Inc., St. Louis, Mo.
Filed Apr. 1, 1982, Ser. No. 364,490
Term of patent 14 years
U.S. Cl. D2—309

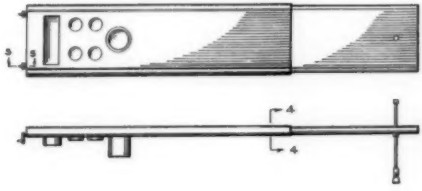


273,440
CAMERA STRAP
Richard C. Fulwiler, Box 141, Madison, Wis. 53701
Filed Dec. 26, 1978, Ser. No. 973,380
Term of patent 14 years
U.S. Cl. D2—400

273,441
TAPE CARTRIDGE HOLDER FOR AN AUTOMOBILE
Gerald R. Anderson, 1621 Rock Hollow, Norman, Okla. 73071
Filed Jun. 12, 1981, Ser. No. 273,007
Term of patent 14 years
U.S. Cl. D3—35



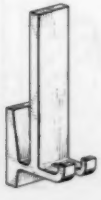
273,442
AUTOMOBILE TRAY
Warren C. Schroeder, Gellett Suite C-603, 2400 Virginia Ave. NW., Washington, D.C. 20037
Filed Apr. 14, 1981, Ser. No. 254,090
Term of patent 14 years
U.S. Cl. D3—40



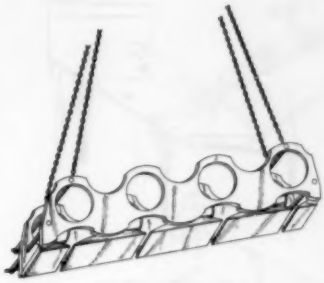
273,443
POCKET CLOTHES BRUSH
Leonhard Hagedorn, Niederneisen, and Rolf-Günter Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.
Filed Mar. 10, 1981, Ser. No. 242,499
Term of patent 14 years
U.S. Cl. D4—23.1

273,444
CHAIR
Walter F. Harper, Jr., Highway 211, Eagle Springs, N.C. 27242, and Thomas W. Winecoff, 2316 Ravenhill Dr., Raleigh, N.C. 27609
Filed Jul. 6, 1981, Ser. No. 280,465
The portion of the term of this patent subsequent to Sep. 13, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—70

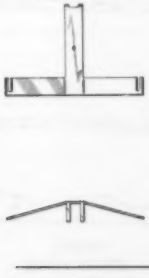
273,445
COMBINED HOLDER FOR TOOTHBRUSHES AND DRINKING GLASSES
Oskar R. Lohman, Nacka, Sweden, assignor to AB Trama, Nacka, Sweden
Division of Ser. No. 130,040, Mar. 13, 1980, Pat. No. Des. 269,143. This application May 19, 1981, Ser. No. 265,082
Claims priority, application Sweden, Sep. 13, 1979, 79-2033; Nov. 16, 1979, 79-2525
Term of patent 14 years
U.S. Cl. D6—92



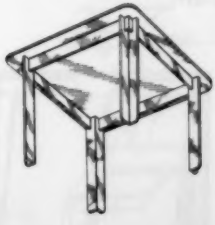
273,446
SUSPENDED WINE BOTTLE AND GLASS RACK COMBINATION
Carl A. Rankin, and Douglas B. Rankin, both of 29075 Buchanan Dr., Bay Village, Ohio 44140
Filed Dec. 21, 1981, Ser. No. 332,493
Term of patent 14 years
U.S. Cl. D6—113



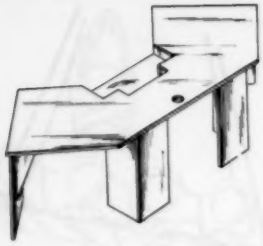
273,447
WALL MOUNTED DISPLAY HOLDER FOR VISORED CAPS
Harry P. Capers, Jr., 9615 Richmond, Houston, Tex. 77063
Filed Feb. 22, 1982, Ser. No. 351,198
Term of patent 14 years
U.S. Cl. D6—116



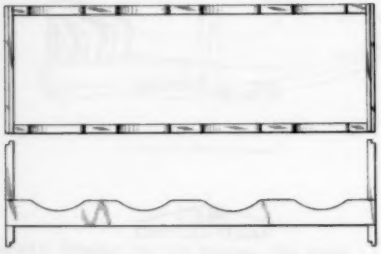
273,448
TABLE
Ross M. Colquhoun, 412 Richmond St. East, Toronto M5A 1P8, Ontario, Canada
Filed Jul. 14, 1981, Ser. No. 283,252
Claims priority, application Canada, Jan. 22, 1981, 220181
Term of patent 14 years
U.S. Cl. D6—177



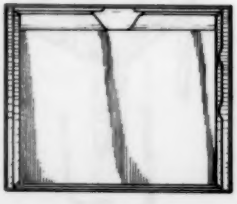
273,449
DATA TERMINAL DESK
Casey J. Wieczorek, Basking Ridge, N.J., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Sep. 22, 1980, Ser. No. 189,517
Term of patent 14 years
U.S. Cl. D6—188



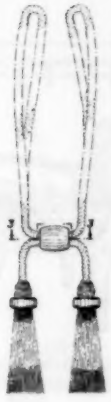
273,450
STACKABLE WINE RACK
Barry E. Williams, 8200 Boulevard East, North Bergen, N.J. 07047
Filed Oct. 26, 1981, Ser. No. 314,794
Term of patent 14 years
U.S. Cl. D6—188



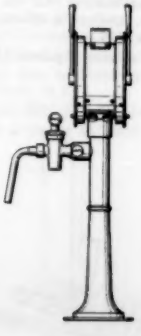
273,451
AUTOMOBILE SEAT BACK
George D. Bowman, Detroit, Mich., assignor to The Model A and Model T Motor Car Reproduction Corp., Wixom, Mich.
Filed Aug. 8, 1979, Ser. No. 64,839
Term of patent 14 years
U.S. Cl. D6—197



273,452
TIE BACK
Arthur M. Ackerman, Brooklyn, N.Y., assignor to Novelty Cord & Tassel Co., Inc., Brooklyn, N.Y.
Filed Apr. 14, 1981, Ser. No. 254,131
Term of patent 14 years
U.S. Cl. D6—208.2



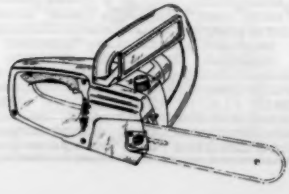
273,453
BEER TAP
Karl H. Knopf, Kohlfurth 50, 5650 Solingen, Fed. Rep. of Germany
Filed Oct. 13, 1981, Ser. No. 310,752
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1981, 5 MR 9171
Term of patent 14 years
U.S. Cl. D7—398



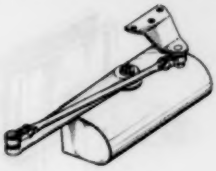
273,454
OPEN END WRENCH
Donald Pyles, Dallas, Tex., assignor to Sigalos, Levine and Hall, Dallas, Tex.
Filed Oct. 5, 1981, Ser. No. 309,989
Term of patent 14 years
U.S. Cl. D8—28

273,455
EXPANDER TOOL
Jay M. Teitelbaum, and Henry S. Teitelbaum, both of 3840 S. Jason St., Engelwood, Colo. 80110
Filed Aug. 21, 1981, Ser. No. 294,937
Term of patent 14 years
U.S. Cl. D8—52

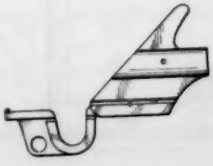
273,456
CHAIN SAW WITH HANDGUARD
Robert McDougall, Brockville; Ian F. Norton, Toronto; Douglas G. Overbury, and Colin Overy, both of Brockville, all of Canada, assignors to Black & Decker Inc., Newark, Del.
Filed Nov. 18, 1980, Ser. No. 207,929
Term of patent 14 years
U.S. Cl. D8—65



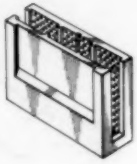
273,457
DOOR CLOSER
Yoshihiko Matsuo, Yokohama, and Takeshi Shohoji, Funabashi, both of Japan, assignors to Ryobi Limited, Hiroshima, Japan
Filed May 26, 1982, Ser. No. 382,206
Claims priority, application Japan, Dec. 24, 1981, 56-57785
Term of patent 14 years
U.S. Cl. D8—330



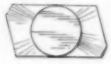
273,458
BOAT HOOK
Oiva Laine, Torenintie 39, SF-01900 Nurmijärvi, Finland
Filed Mar. 24, 1981, Ser. No. 247,695
Claims priority, application Finland, Mar. 31, 1980, 252/80
Term of patent 14 years
U.S. Cl. D8—356



273,459
WINDOW PANE HOLDER OR SIMILAR ARTICLE
Moriji Akabane, Atsugi, Japan, assignor to Hori Glass Co., Ltd., Kanagawa, Japan
Filed Jul. 30, 1982, Ser. No. 403,548
Term of patent 14 years
U.S. Cl. D8—373

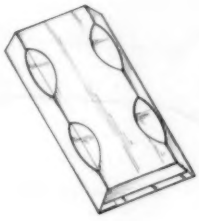


273,460
BOLT
William I. Sturm, Niles, Ill., assignor to SP Industries, Inc., Chicago, Ill.
Filed Jul. 20, 1981, Ser. No. 284,901
Term of patent 14 years
U.S. Cl. D8—387

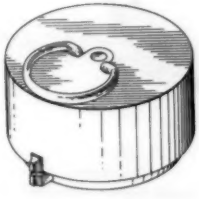


273,461
JAR
Peter W. Sevenoaks, East Twickenham, England, assignor to Metal Box Limited, Reading, England
Filed Aug. 10, 1981, Ser. No. 291,369
Term of patent 14 years
U.S. Cl. D9—355

273,462
CARTON
Duane R. Mode, Edina, Minn., assignor to Champion International Corporation, Stamford, Conn.
Filed Sep. 11, 1981, Ser. No. 302,138
Term of patent 14 years
U.S. Cl. D9—431

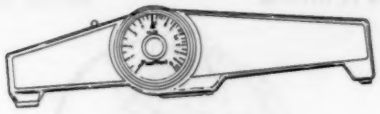


273,463
CLOSURE CAP
Glenn H. Morris, 4203 Highwood Dr., Chattanooga, Tenn. 37415
Division of Ser. No. 169,881, Jul. 17, 1980, Pat. No. No. Des. 268,484. This application Aug. 23, 1982, Ser. No. 410,477
Term of patent 14 years
U.S. Cl. D9—443



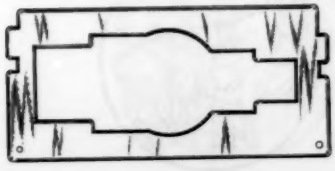
273,464
CLOCK
Richard C. Stees, 4636 Moorpark Ave., San Jose, Calif. 95129
Filed Dec. 11, 1981, Ser. No. 329,770
Term of patent 14 years
U.S. Cl. D10—6

273,465
POSITEST THICKNESS GAGE
Frank Koch, Ogdensburg, N.Y., assignor to DeFelsko Corporation, Ogdensburg, N.Y.
Filed Oct. 23, 1981, Ser. No. 314,384
Term of patent 14 years
U.S. Cl. D10—46

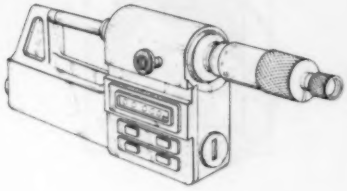


273,466
COMBINED WALL THERMOSTAT AND DIGITAL CLOCK
William J. Lawrence, Dallas; Jerry W. Harrison, Rowlet; Robert J. Wunderlich, Dallas; Clifford W. Herron, Mesquite, and Raymond W. Blasingame, Dallas, all of Tex., assignors to Autotronics, Inc., Dallas, Tex.
Filed Oct. 15, 1979, Ser. No. 84,770
Term of patent 14 years
U.S. Cl. D10—50

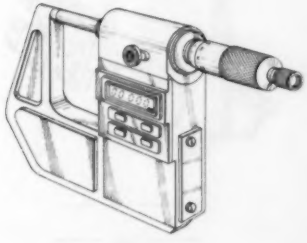
273,467
KINGPIN GAGE
Samuel A. Martin, Holland, Mich., assignor to Holland Hitch Company, Holland, Mich.
Filed Dec. 17, 1981, Ser. No. 331,541
Term of patent 14 years
U.S. Cl. D10—64



273,468
MICROMETER
Minoru Ueda, Kawasaki; Tamenori Shirai, and Takafumi Kanou, both of Kure, all of Japan, assignors to Mitutoyo MGF. Co., Ltd., Tokyo, Japan
Filed Mar. 1, 1982, Ser. No. 353,256
Claims priority, application Japan, Sep. 3, 1981, 56-39002
Term of patent 14 years
U.S. Cl. D10—73

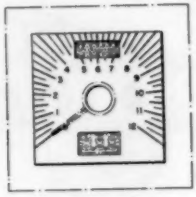


273,469
MICROMETER
Minoru Ueda, Kawasaki; Tamenori Shirai, and Takafumi Kanou, both of Kure, all of Japan, assignors to Mitutoyo MFG. Co., Ltd., Tokyo, Japan
Filed Mar. 1, 1982, Ser. No. 353,258
Claims priority, application Japan, Sep. 3, 1981, 56-39001
Term of patent 14 years
U.S. Cl. D10—73

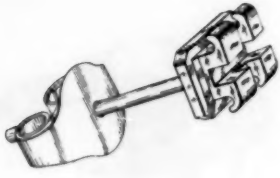


273,470
HOUSING FOR A CONTROL FOR AN ELECTRONIC SIREN
John F. Olson, Deep River, Conn., assignor to Whelen Engineering Co., Inc., Deep River, Conn.
Filed May 28, 1981, Ser. No. 268,014
Term of patent 14 years
U.S. Cl. D10—121

273,471
INDICATOR AND DIAL FACE FOR MARINE KNOTMETER, LOG AND DEPTH SOUNDER
Ronald R. Overs, 96 Fox Hunt La., East Amherst, N.Y. 14051
Filed Jan. 26, 1982, Ser. No. 343,010
Term of patent 14 years
U.S. Cl. D10—125



273,472
EARRING
Glenn Goldstein, 5 Parkside Dr., North Brunswick, N.J. 08902
Filed Jun. 23, 1982, Ser. No. 391,137
Term of patent 14 years
U.S. Cl. D11—75



273,473
PEARL STUD FOR PIERCING EARS
George H. Carroll, 19020 Killoch Way, Northridge, Calif. 91326
Filed Aug. 2, 1982, Ser. No. 404,058
Term of patent 14 years
U.S. Cl. D11—86

273,474
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 247,015
Term of patent 14 years
U.S. Cl. D11—100

273,475
ZODIACAL CUSP MEDALLION
Patrica A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 247,089
Term of patent 14 years
U.S. Cl. D11—100

273,476
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul., 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 247,014
Term of patent 14 years
U.S. Cl. D11—105

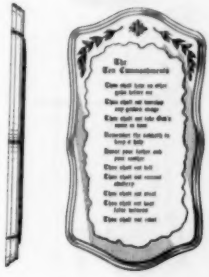
273,477
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 247,016
Term of patent 14 years
U.S. Cl. D11—105

273,478
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 247,103
Term of patent 14 years
U.S. Cl. D11—105

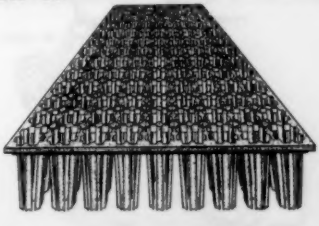
273,479
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 247,104
Term of patent 14 years
U.S. Cl. D11—105

273,480
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. Des. 263,384.
This application Mar. 24, 1981, Ser. No. 248,191
Term of patent 14 years
U.S. Cl. D11—105

273,481
PLAQUE
Donald R. Ditto, Rte. 2, Box 60F2, Winnsboro, Tex. 75494
Filed Dec. 21, 1981, Ser. No. 332,614
Term of patent 14 years
U.S. Cl. D11—139



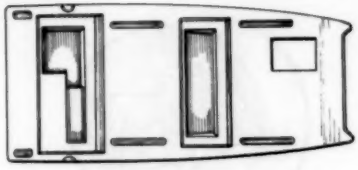
273,482
SEEDLING FLAT
Gustav O. Andréason; Ulf R. Friberg, both of Falun; Heimo H. Kuvaja, Borlänge, and Bengt G. L. Qvarnström, Smygehamn, all of Sweden, assignors to Stora Kopparbergs Bergslags AB, Falun, Sweden
Filed Aug. 11, 1980, Ser. No. 170,943
Claims priority, application Sweden, Feb. 15, 1980, 8000032
Term of patent 14 years
U.S. Cl. D11—155



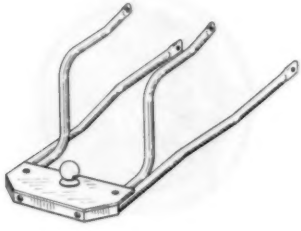
273,483
FIGURINE OF AN EAGLE
Jesus A. C. Santa-Eulalia, and Javier B. C. Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Co., Inc., Laguna Hills, Calif.
Filed Jun. 17, 1982, Ser. No. 389,546
Term of patent 14 years
U.S. Cl. D11—162

273,484
FOLDING BICYCLE
Hugh G. Herbert, 1B Limpsfield Ave., London, SW19 6DL, England
Filed Oct. 12, 1979, Ser. No. 84,309
Claims priority, application United Kingdom, Apr. 20, 1979, 989573
Term of patent 14 years
U.S. Cl. D12—111

273,485
FLOOR PAN FOR AN AUTOMOBILE
George D. Bowman, Detroit, Mich., assignor to Model A & Model T Motor Car Reproduction Co., Wixom, Mich.
Filed Aug. 8, 1979, Ser. No. 64,838
Term of patent 14 years
U.S. Cl. D12—159

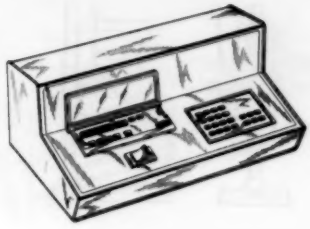


273,486
MOTORCYCLE HITCH
James O'Rourke, Unit 4, 8131 Keele St., Concord, Ontario, Canada (L4K 1C8)
Filed Jan. 11, 1982, Ser. No. 338,755
Claims priority, application Canada, Sep. 15, 1981, 15-09-81-10
Term of patent 14 years
U.S. Cl. D12—162

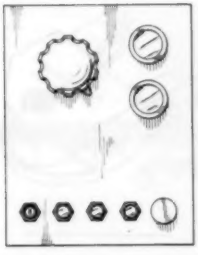


273,487
PORTABLE MANUAL CONTROL UNIT
Saul Rosenbaum, East Meadow, and Gilbert Oster, New Hyde Park, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Nov. 19, 1981, Ser. No. 322,812
Term of patent 14 years
U.S. Cl. D13—12

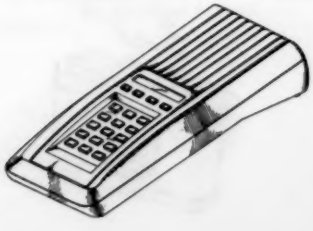
273,488
PROGRAMMABLE CONTROL UNIT
Saul Rosenbaum, East Meadow, and Gilbert Oster, New Hyde Park, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.
Filed Nov. 19, 1981, Ser. No. 322,813
Term of patent 14 years
U.S. Cl. D13—12



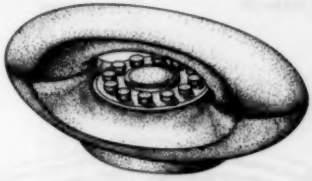
273,489
CONTROL PANEL FOR AN ELECTRICAL LIVESTOCK CARCASS STIMULATOR
Britton Rice, College Station, Tex., assignor to Koch Supplies Inc., Kansas City, Mo.
Filed Nov. 28, 1980, Ser. No. 211,356
Term of patent 14 years
U.S. Cl. D13—35



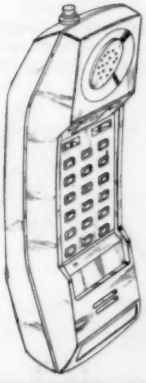
273,490
TELEPHONE SET
Tung Sing Chen, Fl. 9, No. 57, Chang Chun Rd., Taipei, Taiwan
Filed Aug. 18, 1981, Ser. No. 293,942
Term of patent 14 years
U.S. Cl. D14—53



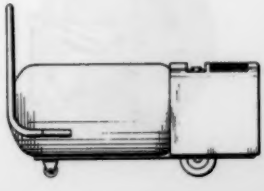
273,491
TELEPHONE
George D. Perkins, Laguna Niguel, Calif., assignor to American Telecommunications Corp., El Monte, Calif.
Filed Sep. 24, 1981, Ser. No. 305,192
Term of patent 14 years
U.S. Cl. D14—53



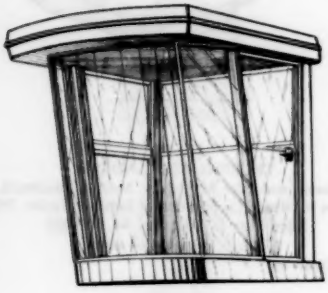
273,492
TELEPHONE HANDSET
John C. Coons, and Jean M. Beirise, both of Cincinnati, Ohio, assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed May 1, 1981, Ser. No. 259,603
Term of patent 14 years
U.S. Cl. D14—64



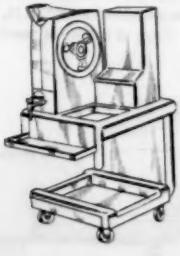
273,493
PORTABLE AIR COMPRESSOR
Massimo Vitaloni, Rivalta, Italy, assignor to Grenco S.p.A., Turin, Italy
Filed Sep. 28, 1981, Ser. No. 306,618
Claims priority, application Italy, Mar. 31, 1981, 53069/81[U]
Term of patent 14 years
U.S. Cl. D15—9



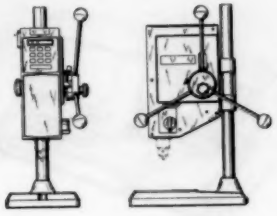
273,494
CAB FOR A HARVESTING MACHINE
Joseph C. Hurlburt; Constantine J. Kermes, both of Lancaster, Pa.; Charles P. Klasen, Canton, Conn., and Joseph A. Rinaldi, Oradell, N.J., assignors to Sperry Corporation, New Holland, Pa.
Filed Jun. 7, 1982, Ser. No. 385,732
Term of patent 14 years
U.S. Cl. D15—30



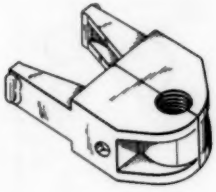
273,495
JUICE VENDING MOBILE
Morley L. Smith, Beaconsfield, Canada, assignor to Orangematic Canada, Inc., Canada
Filed Apr. 22, 1980, Ser. No. 142,717
Claims priority, application Canada, Oct. 24, 1979, 24-10-79-3
Term of patent 14 years
U.S. Cl. D7—311



273,496
DRILL PRESS OR SIMILAR ARTICLE
Lawrence E. House, II, Baltimore, Md., assignor to Black & Decker Inc., Newark, Del.
Filed Feb. 4, 1981, Ser. No. 231,427
Term of patent 14 years
U.S. Cl. D15—132

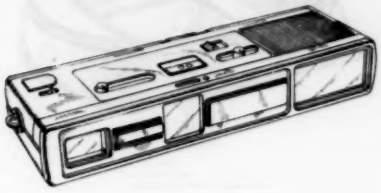


273,497
QUICK ATTACHMENT STOP MEMBER FOR A THREADED FEED ROD OF A MACHINE TOOL
Norbert F. Steineman, New Bremen, Ohio, assignor to Reliable Products Co. Inc., St. Marys, Ohio
Filed Jun. 22, 1981, Ser. No. 275,864
Term of patent 14 years
U.S. Cl. D15—138



273,498
CAMERA
Jerry Arnott, Brookvale, Australia, assignor to Hanimex Pty. Limited, Brookvale, Australia
Filed Nov. 16, 1981, Ser. No. 321,743
Claims priority, application Australia, May 18, 1981, 84199
Term of patent 14 years
U.S. Cl. D16—6

273,499
CAMERA
Jerry Arnott, Brookvale, Australia, assignor to Hanimex Pty. Limited, Brookvale, Australia
Filed Nov. 16, 1981, Ser. No. 321,744
Claims priority, application Australia, May 18, 1981, 84198
Term of patent 14 years
U.S. Cl. D16—6



273,500
GUITAR
Mark Dornan, 1503 Beach Front, Point Pleasant, N.J. 08742
Filed Jun. 11, 1979, Ser. No. 47,128
Term of patent 14 years
U.S. Cl. D17—18

273,501
ELECTRONIC TYPEWRITER
Masahiro Kando, and Noriaki Haranishi, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 16, 1981, Ser. No. 284,096
Claims priority, application Japan, Jan. 23, 1981, 56-2085
Term of patent 14 years
U.S. Cl. D18—1

273,502
ELECTRONIC CALCULATOR
Keiji Sakata, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Feb. 22, 1982, Ser. No. 351,229
Claims priority, application Japan, Aug. 25, 1981, 56-37884
Term of patent 14 years
U.S. Cl. D18—7

273,503
TOY SLIDE
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Sep. 21, 1981, Ser. No. 303,769
Term of patent 14 years
U.S. Cl. D21—121

273,504
TOY BALL
James E. Routzong, Beverly; Russell Richter, Rowley, and Alfred H. Moraski, Braintree, all of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Feb. 12, 1982, Ser. No. 348,434
Term of patent 14 years
U.S. Cl. D21—204

273,505
TOY BALL
James E. Routzong, Beverly; Russell Richter, Rowley, and Alfred H. Moraski, Braintree, all of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Feb. 12, 1982, Ser. No. 348,440
Term of patent 14 years
U.S. Cl. D21—204

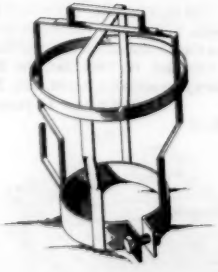
273,506
TOY BALL
James E. Routzong, Beverly; Russell Richter, Rowley, and Alfred H. Moraski, Braintree, all of Mass., assignors to CPG Products Corp., Minneapolis, Minn.
Filed Feb. 12, 1982, Ser. No. 348,441
Term of patent 14 years
U.S. Cl. D21—204

273,507
TENNIS RACKET FRAME
Minoru Yoneyama, Koshiji, Japan, assignor to Yonex Sports Kabushiki Kaisha, Niigata, Japan
Filed Apr. 28, 1981, Ser. No. 258,273
Claims priority, application Japan, Mar. 6, 1981, 56-8934
Term of patent 14 years
U.S. Cl. D21—212

273,508
TOY SANDBOX
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Sep. 21, 1981, Ser. No. 303,765
Term of patent 14 years
U.S. Cl. D21—252

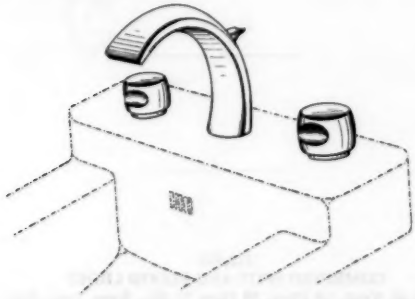
273,509
FISHING LURE BODY
Steven L. Marx, 510 N. Main St., London, Ohio 43140
Filed Mar. 1, 1982, Ser. No. 353,475
Term of patent 14 years
U.S. Cl. D22—27

273,510
COMBINED GAUGE AND TANK GUARD
Michael J. Mayor, 3790 Astro Way, Salt Lake City, Utah 84117
Filed Jun. 22, 1981, Ser. No. 275,913
Term of patent 14 years
U.S. Cl. D23—2



273,511
TWO FLUID PRESS-FEEDING PUMP
Yoji Tanaka, Kawasaki, Japan, assignor to Kabushiki Kaisha Nisshiri, Japan
Filed Aug. 10, 1981, Ser. No. 291,177
Claims priority, application Japan, Feb. 17, 1981, 56-000636
Term of patent 14 years
U.S. Cl. D23—14

273,512
FAUCET SET
Gerd Arnolds, Hahnenfurther Str. 19, 4000 Düsseldorf, Fed. Rep. of Germany
Filed Jun. 11, 1981, Ser. No. 272,828
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 89AR39/81
Term of patent 14 years
U.S. Cl. D23—25



273,513
LINEAR SURGICAL STAPLING INSTRUMENT
Lawrence E. Spreckelmeier, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio
Filed Jun. 10, 1983, Ser. No. 503,230
Term of patent 14 years
U.S. Cl. D24—26

273,514
IMPLANTABLE DEFIBRILLATOR PATCH ELECTRODE OR SIMILAR ARTICLE
Marlin S. Heilman, Gibsonia, and Alois A. Langer, Pittsburgh, both of Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.
Filed Aug. 5, 1980, Ser. No. 175,821
Term of patent 14 years
U.S. Cl. D24—29

273,515
ORTHODONTIC NIPPLE
John W. Fabjancic, Mantua, Ohio, assignor to Questor Corporation, Tampa, Fla.
Filed Nov. 16, 1981, Ser. No. 321,805
Term of patent 14 years
U.S. Cl. D24—46

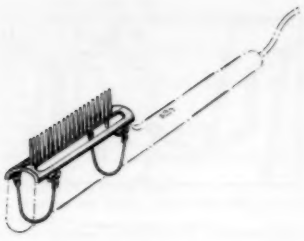
273,516
ARM SLING
Myrna A. Saal, 3254 Central Ave., Spring Valley, Calif. 92077
Filed Aug. 17, 1981, Ser. No. 293,371
Term of patent 14 years
U.S. Cl. D24—64

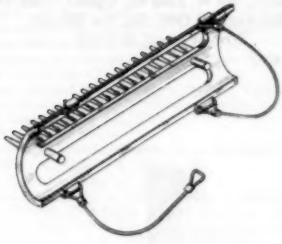
273,517
HEATING PAD
William F. Medlin, Phoenix, Ariz., and Aurora Soto, 14801 N. Flamenco Dr., Phoenix, Ariz. 85023, assignors to Aurora Soto
Filed May 7, 1979, Ser. No. 36,635
Term of patent 14 years
U.S. Cl. D24—99

273,518
WINDOW UNIT
Franklin Moore, Jr., 902 McBurney Dr., Lebanon, Ohio 45036
Filed Jan. 11, 1982, Ser. No. 338,413
Term of patent 14 years
U.S. Cl. D25—52

273,519
COMBINED SPOT AND FLOOD LIGHT
Chan M. Kong, 1st Floor, 58 Hung To Rd., Kwun Tong, Kowloon, Hong Kong
Filed May 26, 1981, Ser. No. 266,808
Claims priority, application United Kingdom, Feb. 20, 1981, 999010
Term of patent 14 years
U.S. Cl. D26—48

273,520
UNIVERSAL COMB ATTACHMENT
Sterling A. Frey, 4238 Bordeaux, St. Louis, Mo. 63129
Filed Feb. 12, 1981, Ser. No. 233,909
Term of patent 14 years
U.S. Cl. D28—18

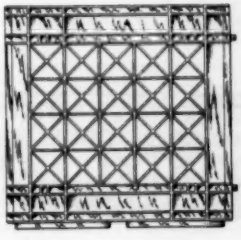




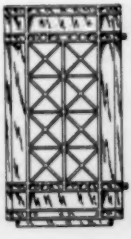
273,521
ELECTRIC DRYSHAVER
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Jul. 30, 1980, Ser. No. 173,775
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1980, 73 MR 8862
Term of patent 14 years
U.S. Cl. D28—49

273,522
HAND CART
Stephen R. Zastera, Bloomington, Minn., assignor to D.R.I. Industries, Inc., Minneapolis, Minn.
Filed Nov. 30, 1981, Ser. No. 326,112
Term of patent 14 years
U.S. Cl. D34—17

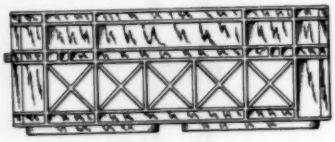
273,523
STACKABLE PLASTIC CRATE
Frank DiSesa, Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Filed Jan. 18, 1982, Ser. No. 340,304
Term of patent 14 years
U.S. Cl. D34—43



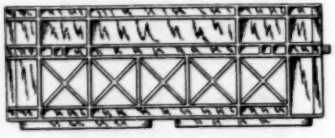
273,524
STACKABLE PLASTIC CRATE
Frank DiSesa, Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Filed Jan. 18, 1982, Ser. No. 340,305
Term of patent 14 years
U.S. Cl. D34—43



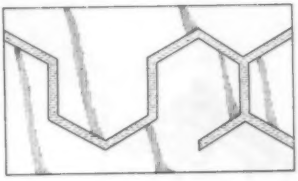
273,525
STACKABLE PLASTIC CRATE
Frank DiSesa, Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Filed Jan. 18, 1982, Ser. No. 340,306
Term of patent 14 years
U.S. Cl. D34—43



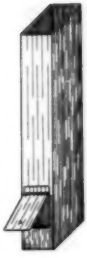
273,526
STACKABLE PLASTIC CRATE
Frank DiSesa, Lunenburg, Mass., assignor to Tucker Housewares, Inc., Leominster, Mass.
Filed Jan. 18, 1982, Ser. No. 340,311
Term of patent 14 years
U.S. Cl. D34—43



273,527
PLASTIC SHEET MATERIAL FOR SURFACING A WALL PANEL OR SIMILAR ARTICLE
Joseph Pota, 9727 Mt. Pisgah Rd, Silver Spring, Md. 20903
Continuation-in-part of Ser. No. 105,574, Dec. 20, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 301,845
Term of patent 14 years
U.S. Cl. D92—1 V



273,528
COMBINED STORAGE AND SUPPORT POST FOR MAIL BOX
Richard P. Thomas, 584 W. 22nd St., Upland, Calif. 91786
Filed Aug. 24, 1981, Ser. No. 295,630
Term of patent 14 years
U.S. Cl. D99—43



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF APRIL, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Nattermann & Cie GmbH: *See*—
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Gunther, Bernd-Rainer, 4,443,378, Cl. 260-403.000.

A. O. Smith Corporation: *See*—
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A/S Hoyer-Ellefsen: *See*—
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A. W. Manufacturing Inc.: *See*—
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Aaccurate Counters Company: *See*—
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Abe, Motoaki: *See*—
Matsumoto, Hiroyuki; Abe, Motoaki; and Ando, Tetsuo, 4,443,886, Cl. 377-58.000.

Abiko, Shuzo: *See*—
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,443,826, Cl. 360-113.000.

Abitz, Morf, Gritschneder: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,443,587, Cl. 526-146.000.

ACF Chemiefarma N.V.: *See*—
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Handricus B. A., 4,443,453, Cl. 424-258.000.

Achinger, Michael; Streitenberger, Walter; Voigt, Otto K. H.; and Wolter, Hans, to Achinger, Michael. Machine for producing flaskless molds. 4,442,882, Cl. 164-187.000.

Acme Burgess, Inc.: *See*—
Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., 4,442,977, Cl. 239-332.000.

Acumeter Laboratories, Inc.: *See*—
McIntyre, Frederic S., 4,443,491, Cl. 427-44.000.

Adachi, Masami; Shimasaki, Hirato; Nomizu, Isao; and Matsuzaki, Taketo, to Bridgestone Tire Company Limited. Adhesive compound coating apparatus. 4,442,791, Cl. 118-669.000.

Adamoski, William; and Hotchkiss, Alan B., to Pitney Bowes Inc. Inserter with improved ram mechanism. 4,443,007, Cl. 271-269.000.

Adams, James E.; and Laurie, Alexander S., to Wilkinson Sword Limited. Seed planting device. 4,442,627, Cl. 47-56.000.

Adcock, Ralph L., to Sperry Corporation. Dual port exchange memory between multiple microprocessors. 4,443,846, Cl. 364-200.000.

Adelmann, Manfred: *See*—
Heller, Gerhard; Adelmann, Manfred; Wendorf, Wilfried; and Konigs, Wilhelm, 4,443,174, Cl. 425-147.000.

Advanced Crystal Sciences, Inc.: *See*—
Zaferes, Constantine J., 4,443,410, Cl. 422-245.000.

Advanced Interconnections: *See*—
Murphy, James V., 4,442,938, Cl. 206-329.000.

Advanced Micro Devices, Inc.: *See*—
McGlinchey, Gerard F., 4,443,753, Cl. 323-313.000.

Adwest Engineering Limited: *See*—
Millard, Barry J., 4,442,579, Cl. 29-157.10R.

AGIP, S.p.A.: *See*—
Motta, Valerio, 4,443,395, Cl. 264-117.000.

Agoston, Edward E. Jig assembly for drilling vertically upward. 4,442,905, Cl. 173-36.000.

Aguilar, Hector V., to American Telecommunications Corp. Telephone jack. 4,443,051, Cl. 339-107.000.

Ahejew, Alexander. Simultaneous double-acting split abrasive wheel for peripheral sharpening of helix tools and use thereof. 4,442,637, Cl. 51-288.000.

Ainoya, Masayuki; Kozawa, Hiroomi; and Chikuzenya, Takao, to Hitachi Koki Co., Ltd. Yoke mechanism of electrophotographic printing apparatus. 4,443,091, Cl. 355-3.0TR.

Aisan Industry Co., Ltd.: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, 4,443,388, Cl. 261-39.00A.

Aisin Seiki Kabushiki Kaisha: *See*—
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Aisin Warner Kabushiki Kaisha: *See*—
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Akiyama, Hiroyuki; Kuwabara, Hideki; Yamaguchi, Toru; and Kishida, Masahiko, to Japan Styrene Paper Corporation. Method of pressurizing treatment of pre-foamed particles of polyolefin resin. 4,443,393, Cl. 264-53.000.

Aktiebolag Somas Ventiler: *See*—
Norder, Stig; and Nilsson, Lars-Erik, 4,442,854, Cl. 137-82.000.

Albarello, Alain, to Thomson-CSF. Process for detecting the melody frequency in a speech signal and a device for implementing same. 4,443,857, Cl. 364-513.500.

Albrent, Gary W.; and Bradus, Robert, to Black & Decker Inc. Indicator system for a power tool comprising dual purpose cam shaft. 4,443,137, Cl. 408-9.000.

Alcan International Limited: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and DeAngelis, Thomas P., 4,443,313, Cl. 204-240.000.

Alcon Laboratories, Inc.: *See*—
Garabedian, Michael E.; and Roehrs, Robert E., 4,443,432, Cl. 424-127.000.

Alderman, Robert J. Privacy and hold circuit for telephone. 4,443,665, Cl. 179-99.00H.

Alexander, Carolyn. Bed covering having an overall pattern and a pocket integrated therein. 4,442,558, Cl. 5-494.000.

Alexander, David H.; Ishizuka, Kachu; and Sato, Robert N. Optical displacement sensor. 4,443,107, Cl. 356-373.000.

Alexandrov, Vladimir N.; Ioffe, Vladimir F.; and Filatov, Oleg V. Directly heated meshed cathode for electronic tubes and method of making. 4,443,735, Cl. 313-345.000.

Alfachimici S.p.A.: *See*—
Tomaiuolo, Francesco; and Bocchino, Mauro, 4,443,257, Cl. 106-1.230.

Alftine, David N., to Litton Systems, Inc. Molecular sieve oxygen monitor. 4,442,698, Cl. 73-23.000.

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Allen-Bradley Co.: *See*—
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Allen, Kelly M.: *See*—
Allen, Ollie J.; and Allen, Kelly M., 4,442,719, Cl. 73-861.290.

Allen, Ollie J.; and Allen, Kelly M. Acoustic flowmeter. 4,442,719, Cl. 73-861.290.

Allied Corporation: *See*—
Mallik, Arjun; and Edelstein, Harold, 4,443,356, Cl. 252-301.170.
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Allis-Chalmers Corporation: *See*—
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Allo, Vincent F.: *See*—
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., 4,442,679, Cl. 62-123.000.

Alloy Surfaces Company, Inc.: *See*—
Baldi, Alfonso L., 4,443,557, Cl. 502-301.000.

Alps Electric Co., Ltd.: *See*—
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Alsthom-Atlantique: *See*—
Thuries, Edmond, 4,443,779, Cl. 336-92.000.

Altena, Edgar, to Zero-Max Industries, Incorporated. Energy saving motor speed controller. 4,443,750, Cl. 318-808.000.

Althouse Tertre, S.A.: *See*—
Brulard, Andre T.; and Gerbaux, Andre A., 4,443,371, Cl. 260-169.000.

Altman, Ronald R. Pastry forming and cutting utensil. 4,442,604, Cl. 30-302.000.

Altron Incorporated: *See*—
Astbury, Arthur A., 4,443,053, Cl. 339-221.00R.

AM International, Inc.: *See*—
Ricciardi, Mario, 4,443,094, Cl. 355-3.0SH.

Amax Inc.: *See*—
Queneau, Paul B.; Hogsett, Robert F.; Beckstead, Leo W.; and Huggins, Dale K., 4,443,415, Cl. 423-68.000.

Ambrosch, Walter: *See*—
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American Cyanamid Company: *See*—
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American Flange & Manufacturing Co. Inc.: *See*—
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American Home Products Corporation: *See*—
Lien, Eric L., 4,443,434, Cl. 424-177.000.
Wei, Peter H. L.; and Bell, Stanley C., 4,443,606, Cl. 546-114.000.

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American Screen Printing Equipment Company: *See—*
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American Telecommunications Corp.: *See—*
Aguilar, Hector V., 4,443,051, Cl. 339-107.000.

Amici, Carmine J., to C.G.J. Inc. Accessory grill converter. 4,442,824, Cl. 126-14.000.

Ammon, George J., to RCA Corporation. Track jump servo system for disc player. 4,443,869, Cl. 369-41.000.

Amos, Walter, to Blendax-Werke R. Schneider GmbH & Co. Container for dispensing a viscous liquid medium. 4,442,958, Cl. 222-213.000.

AMP Incorporated: *See—*
Eaby, Daniel G.; and Shuey, John R., 4,443,052, Cl. 339-113.00R.
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Moist, Stanford C., Jr., 4,443,048, Cl. 339-63.00M.

Ampro Corporation: *See—*
Smith, Stephen N., 4,443,009, Cl. 272-104.000.

Anderson, Bradley D.; and Conradi, Robert A., to Upjohn Company, The. Amine containing ester prodrugs of corticosteroids. 4,443,440, Cl. 424-243.000.

Anderson, Dennis C., to National Polymers Inc. Easily assembled combination flower pot and tray. 4,442,629, Cl. 47-71.000.

Anderson, Max F. Apparatus for harnessing wave motion and solar energy and coriolis acceleration of nature for solar distillation use. 4,442,887, Cl. 165-85.000.

Anderson Strathclyde Limited: *See—*
Brown, Henry M., 4,443,038, Cl. 299-81.000.

Andis Company: *See—*
Andis, Matthew L., 4,443,688, Cl. 219-222.000.

Andis, Matthew L., to Andis Company. Electrically heated hair curling appliance with removable rotatable hair grooming member. 4,443,688, Cl. 219-222.000.

Ando, Hideo, to Tokyo Shibaura Denki Kabushiki Kaisha. Data recording medium. 4,443,806, Cl. 346-135.100.

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Annen, Heinz; Schneebeli, Friedrich; and Pirchl, Helmut, to Escher Wyss Limited. Deformable rotor for a hydroelectric machine. 4,443,727, Cl. 310-261.000.

Anthon, Erik W., to Optical Coating Laboratory, Inc. Optical system for optical disc reader. 4,443,873, Cl. 369-110.000.

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Aoki, Masahiro: *See—*
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Apley, Walter J.; Cliff, William C.; and Creer, James M., to United States of America, Energy. Sampling device for withdrawing a representative sample from single and multi-phase flows. 4,442,720, Cl. 73-863.310.

Applied Power Inc.: *See—*
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Arai, Kiyoshi, to Sony Corporation. Thermal printing apparatus with reference gray scale comparator. 4,443,121, Cl. 400-120.000.

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Aschwanden, Felix; and Groeneweg, Willem H., to RCA Corporation. Frequency search system for a phase locked loop. 4,443,769, Cl. 329-50.000.

Associated Equipment Corporation: *See—*
Humphrey, Wayne R., 4,443,751, Cl. 320-2.000.

Astbury, Arthur A., to Altron Incorporated. Electrical contact. 4,443,053, Cl. 339-221.00R.

Asulab, S.A.: *See—*
Bui, Ngoc C., 4,443,757, Cl. 324-77.00B.

AT & T Bell Telephone Laboratories, Incorporated: *See—*
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AT&T Technologies, Inc.: *See—*
Foo, George; Grodkiewicz, Raymond W.; Kubis, Stanley E.; and Lindsay, Gordon C., 4,442,582, Cl. 29-403.300.

Atlantic Richfield Company: *See—*
Hearn, Daniel P., 4,443,702, Cl. 250-357.100.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,644, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,645, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,646, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,647, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,648, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,649, Cl. 585-500.000.
Lichtin, Norman N.; and Berman, Elliot, 4,443,311, Cl. 204-158.00R.

Atlas, Sheldon M., to Rosenwald, Peter. Antistatic fabrics incorporating specialty textile fibers having high moisture regain and articles produced therefrom. 4,443,515, Cl. 428-224.000.

Auer, Werner, to Teldix GmbH. North seeking and course keeping gyro device. 4,442,723, Cl. 74-5.470.

August Hohnholz KG: *See—*
Melchior, Bernd, 4,443,391, Cl. 264-22.000.

Austin, Warren; and Penny, Alex, to Aaccurate Counters Company. Coin counter. 4,442,850, Cl. 133-3.00H.

Auth, Werner; and Felger, Gunter, to Robert Bosch GmbH. Electronically controlled fuel metering system. 4,442,817, Cl. 123-489.000.

Automotive Products Limited: *See—*
Hodkinson, Harold; and Haines, William E., 4,442,924, Cl. 188-79.5GT.

Avco Corporation: *See—*
Fish, Leonard A., 4,442,781, Cl. 109-53.000.
McMurray, John H.; and Miller, Jule, 4,442,968, Cl. 228-231.000.

Avedikian, Souren Z. Instant starting briquettes. 4,443,227, Cl. 44-6.000.

Avery, Grant D., to Sprague Electric Company. Symmetrical-hysteresis Hall switch. 4,443,716, Cl. 307-309.000.

Aviation Electric Ltd.: *See—*
MacIsaac, Bernard D., 4,442,667, Cl. 60-39.281.

Baba, Kazuo. Ultrasonic scanner for examination of a coeliac cavity. 4,442,842, Cl. 128-660.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.

Babcock Power Limited: *See*—
Hodgkin, Alan F., 4,442,678, Cl. 60-676.000.

Babcock & Wilcox Company, The: *See*—
Seifert, Thomas P.; and Longfield, Warren E., 4,442,800, Cl. 122-379.000.

Bader, Ghassan: *See*—
Dean, Raymond H.; and Bader, Ghassan, 4,442,760, Cl. 98-40.00D.

Baer, Don E.: *See*—
Long, Ralph W.; Smith, Charles B.; and Baer, Don E., 4,442,975, Cl. 239-150.000.

BagMan, Inc.: *See*—
Vetter, Bruce W., 4,442,960, Cl. 224-32.00A.

Bailey, Gary C., to United States of America, National Aeronautics and Space Administration. Integrating IR detector imaging systems. 4,443,701, Cl. 250-332.000.

Bailey, John R. Can crushing apparatus. 4,442,768, Cl. 100-233.000.

Baillet, Douglas G.: *See*—
Graham, Douglas A.; Baillet, Douglas G.; and Sankey, Mark, 4,442,606, Cl. 33-1.00N.

Baker, Alfred L.: *See*—
Payne, Thomas R.; and Baker, Alfred L., 4,443,690, Cl. 219-506.000.

Baker, CAC, Inc.: *See*—
Goans, Kip B., 4,442,756, Cl. 92-23.000.
Goans, Kip B., 4,442,757, Cl. 92-82.000.

Baker Oil Tools, Inc.: *See*—
Callihan, Rudy B.; and Wainwright, Clyde, 4,442,894, Cl. 166-156.000.
Underdown, David R.; and Glaze, O. Howard, 4,443,347, Cl. 252-8.55R.

Bakker, Fredrick J.: *See*—
Martin, Samuel A.; Bakker, Fredrick J.; Hungerink, Gerald W.; Gisinger, Jack L.; and Bush, James H., 4,443,025, Cl. 280-407.000.

Baldi, Alfonso L., to Alloy Surfaces Company, Inc. Treatment of catalytic Raney nickel. 4,443,557, Cl. 502-301.000.

Baldwin Piano & Organ Company: *See*—
Simmons, Carlton J., Jr.; and Uetrecht, Dale M., 4,442,746, Cl. 84-1.010.

Ball Corporation: *See*—
Stockton, Ronald J.; and Munson, Robert E., 4,442,590, Cl. 29-571.000.

Ballard, Evan O., to United States of America, Energy. Purged window apparatus utilizing heated purge gas. 4,443,072, Cl. 350-584.000.

Ballard, Jack V., Jr., to Macfarlane, John L. Automatic valve bag placer. 4,442,874, Cl. 141-166.000.

Bally Manufacturing Corporation: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,443,209, Cl. 474-94.000.

Balordi, Romano, to Maryland Cup Corporation. Induction furnace for heat shrinking thermoplastic sheet onto mandrels in a forming process. 4,443,679, Cl. 219-10.49R.

Baltes, Eugene: *See*—
Rodriguez, Ludovic; and Baltes, Eugene, 4,443,460, Cl. 424-267.000.

Bandurski, Paul S., to Cam Fran Tool Co., Inc. Lead saddle assembly and apparatus for forming. 4,443,284, Cl. 156-212.000.

Banich, John N., Sr., to Continental White Cap, Inc. Plastic closure with sealing flaps. 4,442,947, Cl. 215-344.000.

Banyu Pharmaceutical Co., Ltd.: *See*—
Yano, Mitsuo; Yoshizawa, Junji; Ishikawa, Kiyofumi; Harada, Nobuo; and Matsumoto, Ikuo, 4,443,459, Cl. 424-266.000.

Bar-Nof, Moshe: *See*—
Hirsch, Gustav M.; and Bar-Nof, Moshe, 4,442,601, Cl. 30-169.000.

Barbaro, Aurelio: *See*—
Pansolli, Paolo; Barbaro, Aurelio; Maimone, Adriano; and Valdiserri, Mario, 4,443,267, Cl. 127-46.200.

Barbier, William J.; and Leimbach, J. George, to Sporlan Valve Company. Pilot-operated pressure regulator valve. 4,442,680, Cl. 62-217.000.

Barcikowski, Gerald F.: *See*—
Pajonas, Thomas L.; Barcikowski, Gerald F.; and Ennaco, Andrew J., 4,442,783, Cl. 110-347.000.

Barger, William L.: *See*—
Cain, Earl S.; Carlson, Jerome A.; and Barger, William L., 4,443,044, Cl. 384-428.000.

Barrett, Richard B., to Exxon Research and Engineering Co. Method for achieving acceptable U_3O_8 levels in a restored formation. 4,443,133, Cl. 405-263.000.

Barrickman, Stephen R.: *See*—
Loeffler, Earl F.; Barrickman, Stephen R.; and Johnsen, John A., 4,443,290, Cl. 156-396.000.

Bartz, Stephen A.: *See*—
Linman, Dale L.; and Bartz, Stephen A., 4,443,099, Cl. 355-75.000.

Basten, Frank; and Oxley, Peter, to Black & Decker Inc. Unitary latching and release means for portable foldable workbench. 4,442,779, Cl. 108-131.000.

Battelle Development Corporation: *See*—
Hillman, Melville E. D., 4,443,637, Cl. 568-876.000.

Battistone, Nick. Food mold. 4,443,176, Cl. 425-276.000.

Baudet, Pierre J. Imino-alkyl and amino-nitrile cyano-guanidine. 4,443,613, Cl. 548-342.000.

Bauer, Frederick T.; and Bechtel, Jon H., to Gentex Corporation. Automatic rearview mirror for automotive vehicles. 4,443,057, Cl. 350-281.000.

Bausch & Lomb Incorporated: *See*—
Smith, Francis X.; and Riedhammer, Thomas M., 4,443,429, Cl. 424-78.000.

Bavin, Lowell R., to Aro Corporation, The. Secondary speed sensor for governed air grinders. 4,443,164, Cl. 418-41.000.

Bavington, Clive R.: *See*—
Pidgeon, Brian G.; and Bavington, Clive R., 4,443,792, Cl. 340-612.000.

Bayat, Bijan. Electric cord reel. 4,442,984, Cl. 242-106.000.

Bayer Aktiengesellschaft: *See*—
Bonse, Gerhard; and Schmidt, Thomas, 4,443,629, Cl. 564-226.000.
Hund, Franz; Hennings, Willi; Brunn, Horst; Kresse, Peter; and Rambold, Wolfgang, 4,443,264, Cl. 106-292.000.
Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, 4,443,132, Cl. 405-260.000.
Musch, Rudiger; Pampus, Gottfried; Muller, Peter; Eisele, Ulrich; Konter, Wolfgang; and Gobel, Wilhelm, 4,443,582, Cl. 525-215.000.
Musch, Rudiger; Pampus, Gottfried; Casper, Rudolf; Muller, Peter; and Gobel, Wilhelm, 4,443,583, Cl. 525-215.000.
Seidler, Helmut; Soll, Manfred; and Wunderlich, Klaus, 4,443,369, Cl. 260-131.000.
Wolff, Joachim; Wolf, Karlheinz; Koll, Jochen; Hornle, Reinhold; Molls, Hans-Heinz; and Paulat, Volker, 4,443,225, Cl. 8-549.000.

Bayerische Motoren Werke AG: *See*—
Fischer, Adolf, 4,442,672, Cl. 60-602.000.

BBC Brown, Boveri & Company, Ltd.: *See*—
Buhler, Karl, 4,443,188, Cl. 432-233.000.
Buhler, Karl; and Oldani, Karl, 4,443,880, Cl. 373-74.000.

Bebb, Hubert: *See*—
Lindsey, Stanley D.; Ioannides, Socrates A.; Horner, Jack R.; Denton, William S.; Shell, Donald P.; and Bebb, Hubert, 4,442,639, Cl. 52-73.000.

Bebruder Buhler AG.: *See*—
Oetiker, Hans; Linzberger, Robert; Ketting, Leendert; and Winteler, Werner, 4,442,980, Cl. 241-34.000.

Becht, Carl T., to Senco Products, Inc. Pressure sensitive and working-gap controlled surgical stapling instrument. 4,442,964, Cl. 227-8.000.

Bechtel, Jon H.: *See*—
Bauer, Frederick T.; and Bechtel, Jon H., 4,443,057, Cl. 350-281.000.

Becker, Josef; Simon, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Process for the production of molded decorative articles from a hardenable substance based on thermosetting synthetic resin. 4,443,392, Cl. 264-25.000.

Beckman Instruments Inc.: *See*—
Meyer, Richard C., 4,442,722, Cl. 73-864.180.

Beckmann, Klaus; Grisebach, Hans-Theodor; and Weirich, Walter, to Gewerkschaft Eisenhutte Westfalia. Control apparatus. 4,443,135, Cl. 405-302.000.

Beckstead, Leo W.: *See*—
Queneau, Paul B.; Hogsett, Robert F.; Beckstead, Leo W.; and Huggins, Dale K., 4,443,415, Cl. 423-68.000.

Beddome, Robert A.; Saunders, John B.; and Fenner, Gary W., to Union Carbide Corporation. Recovery of hydrogen and other components from refinery gas streams by partial condensation using preliminary reflux condensation. 4,443,238, Cl. 62-17.000.

Beecham Group p.l.c.: *See*—
Smale, Terence C., 4,443,599, Cl. 544-90.000.

Beffart, Hans; and Ries, Hans M., to Carl Freudenberg, Firma. Support tubes for cross-wound coils and cross-windings. 4,442,686, Cl. 68-198.000.

Begala, Michael W.: *See*—
DeSantis, Charles M.; Zannella, Albert H.; Begala, Michael W.; Wills, John R.; and Czerwinski, Watson P., 4,443,803, Cl. 343-749.000.

Beggs, George, to Mechanical Plastics Corp. Folding platform and shelves for use in vehicles. 4,443,034, Cl. 296-65.00R.

Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., to Acme Burgess, Inc. Airless electric sprayer. 4,442,977, Cl. 239-332.000.

Bell, Stanley C.: *See*—
Wei, Peter H. L.; and Bell, Stanley C., 4,443,606, Cl. 546-114.000.

Bell Telephone Laboratories, Incorporated: *See*—
Hunt, Richard M., 4,443,667, Cl. 179-115.00R.
Joy, David C.; Kaplan, Martin L.; and Schmidt, Paul H., 4,443,532, Cl. 430-270.000.
Ng, Ying-Wah, 4,443,876, Cl. 371-49.000.
Rolfe, Robert M.; and Shoji, Masakazu, 4,443,882, Cl. 375-36.000.
Starnes, William H., Jr., 4,443,586, Cl. 525-370.000.

Beller, Frank W., to Belson Manufacturing Co., Inc. Meat roaster. 4,442,762, Cl. 99-427.000.

Beller, Frank W., to Belson Manufacturing Co., Inc. Meat roaster. 4,442,763, Cl. 99-427.000.

Belson Manufacturing Co., Inc.: *See*—
Beller, Frank W., 4,442,762, Cl. 99-427.000.
Beller, Frank W., 4,442,763, Cl. 99-427.000.

Belton, John P., Jr., to United States of America, Air Force. Precision digital sampler. 4,443,766, Cl. 328-151.000.

Bendix Corporation, The: *See*—
Eastman, James M., 4,442,928, Cl. 192-3.00N.

Bendix Westinghouse Limited: *See*—
Neal, Brian P.; and Turner, Alan R., 4,442,957, Cl. 222-207.000.
Bennethum, Mary L. Survival and water purification system. 4,443,336, Cl. 210-238.000.
Benscoter, Richard D.: *See*—
Flachbarth, Charles T.; Benscoter, Richard D.; and Sheridan, James E., 4,443,654, Cl. 174-48.000.
Bentele, Benedikt; Schmid, Norbert; and Schonwald, Siegfried, to Siemens Aktiengesellschaft. Liquid ring pump with a control disk arranged between the impeller housing and the cover. 4,443,158, Cl. 417-68.000.
Berezowski, Jaroslaw; and Feinman, Harvey M., to Sealectro Corporation. Electro-optical badge reader. 4,443,693, Cl. 235-458.000.
Bergandy, Wieslaw, to National Instrument Company, Inc. Self-pressurizing pinch valve. 4,442,954, Cl. 222-55.000.
Berger, Michael F., to Tandy Corporation. Data synchronization apparatus. 4,443,883, Cl. 375-116.000.
Bergmann, Gerhard; and Hittel, Gerhard, to Karl Mayer Textilmaschinenfabrik GmbH. Control of weft thread insertion. 4,442,684, Cl. 66-84.00A.
Bergsma, Wijtse; and Venema, Eelke S., to U.S. Philips Corporation. Shaving apparatus. 4,442,597, Cl. 30-43.600.
Berman, Elliot: *See*—
Lichtin, Norman N.; and Berman, Elliot, 4,443,311, Cl. 204-158.00R.
Berry, William J. Golf ball cleaner. 4,442,564, Cl. 15-21.00A.
Berthold, Heinz, to Brueninghaus Hydraulik GmbH. High-pressure piston pump for liquids, preferably for water. 4,443,160, Cl. 417-270.000.
Berthold, Rudiger: *See*—
Papenfuhs, Theodor; and Berthold, Rudiger, 4,443,630, Cl. 564-406.000.
Beske, Lawrence E.: *See*—
Bhattacharyya, Bhupati I.; Slovinsky, Manuel; Wachala, Raymond J.; Beske, Lawrence E.; and McCullar, Michael L., 4,443,576, Cl. 524-522.000.
Beth Israel Hospital Association, The: *See*—
Stemerman, Michael B.; Weinstein, Robert; and Maciag, Thomas, 4,443,546, Cl. 435-240.000.
Bethlehem Steel Corp.: *See*—
Mino, George M.; Dustin, Donald L.; and Williams, John H., 4,443,501, Cl. 427-360.000.
Betz, Clyde B.: *See*—
McGehee, Fred N., Sr.; Peck, Billy J.; Betz, Clyde B.; and Morgan, Calvin R., Jr., 4,442,585, Cl. 29-432.000.
Betz, Karl, to Puritan-Bennett. Oxygen regulator and alarm system for an anesthesia machine. 4,442,856, Cl. 137-98.000.
Betz Laboratories, Inc.: *See*—
May, Roger C.; and Sessa, Frank C., 4,443,340, Cl. 210-697.000.
Bhattacharyya, Bhupati I.; Slovinsky, Manuel; Wachala, Raymond J.; Beske, Lawrence E.; and McCullar, Michael L., to Nalco Chemical Company. Terpolymer composition. 4,443,576, Cl. 524-522.000.
Bhattacharyya, Sushantha K.: *See*—
El-Menshawy, Mohamed F.; and Bhattacharyya, Sushantha K., 4,443,680, Cl. 219-69.00C.
Bhushan, Manjul: *See*—
Catalano, Anthony W.; and Bhushan, Manjul, 4,443,653, Cl. 136-265.000.
Biard, Daniel; and Lodewick, Rainer, to Procter & Gamble Company, The. Rinse aid composition. 4,443,270, Cl. 134-25.200.
Biedermann, Jurgen; Prop, Gerrit; and Doppelfeld, Ille-Stephanie, to A. Nattermann & Cie GmbH. (+)-2-[1-(2,6-Dichlorophenoxy)-ethyl]-1,3-diazacyclopent-2-ene and the method for the treatment of human beings suffering from nervous disarrangements, in particular migraine. 4,443,464, Cl. 424-273.000.
Billcon Corporation of America: *See*—
Hasegawa, Kaiichi, 4,443,006, Cl. 271-10.000.
Birckhead, Robert; and McAlpine, William R. Fabricated beam. 4,442,649, Cl. 52-693.000.
Bishop, Frank A. Broadcast band siren alarm transmitter system for vehicles. 4,443,790, Cl. 340-539.000.
Bishop, Robert; and Damon, Richard. Method of and apparatus for controlling robotic equipment with the aid of mask algorithm image processing techniques. 4,443,855, Cl. 364-513.000.
Biswas, Dipak R.; and Nath, Dilip K., to International Telephone and Telegraph Corporation. Fabrication of optical waveguides using slurry deposition. 4,443,239, Cl. 65-3.110.
Biver, Christian: *See*—
Stas, Georges; and Biver, Christian, 4,443,342, Cl. 210-759.000.
Black & Decker Inc.: *See*—
Albrent, Gary W.; and Bradus, Robert, 4,443,137, Cl. 408-9.000.
Basten, Frank; and Oxley, Peter, 4,442,779, Cl. 108-131.000.
Simpson, Frank F., 4,442,906, Cl. 173-48.000.
Black, Jonathan: *See*—
Brighton, Carl T.; and Black, Jonathan, 4,442,846, Cl. 128-784.000.
Blaimschein, Gottfried, to GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H. Device for milling long workpieces. 4,443,142, Cl. 409-199.000.
Blausten, Edmond J., to International Telephone and Telegraph Corporation. Apparatus and methods of call clearing in a packet switched data communications network. 4,443,875, Cl. 370-60.000.
Blendax-Werke R. Schneider GmbH & Co.: *See*—
Amos, Walter, 4,442,958, Cl. 222-213.000.
Bleys, Christian, to L. Sauvageau & Cie. Blowtorch cutting head, particularly for oxygen cutting. 4,443,003, Cl. 266-48.000.
Blitz, Herman. Dowel pins. 4,443,192, Cl. 433-74.000.
Blomquist, James E.; and Wilczewski, Robert H. Dot matrix print head. 4,443,122, Cl. 400-124.000.
Blucher, Steven L.: *See*—
DiMarzio, Lawrence P.; and Blucher, Steven L., 4,442,749, Cl. 84-1.150.
Blum, Rene: *See*—
Tenud, Leander; and Blum, Rene, 4,443,627, Cl. 564-136.000.
Blythe, Malcolm R.: *See*—
Cramp, Harry D.; Blythe, Malcolm R.; and Williams, Philip D. L., 4,443,797, Cl. 343-5.0SC.
Board of Regents for Oklahoma Agricultural & Mechanical Colleges Acting for Oklahoma State University: *See*—
Whitcomb, Carl E., 4,442,628, Cl. 47-66.000.
Bocchino, Mauro: *See*—
Tomaiuolo, Francesco; and Bocchino, Mauro, 4,443,257, Cl. 106-1.230.
Bock, Lawrence A.: *See*—
Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, 4,443,376, Cl. 260-453.0RZ.
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, to International Flavors & Fragrances Inc. Norbornyl oxybutyraldehyde. 4,443,633, Cl. 568-445.000.
Bodenseewerk Perkin-Elmer & Co., GmbH: *See*—
Huber, Bernhard; Tamm, Rolf; and Tomoff, Toma, 4,443,105, Cl. 356-312.000.
Bodor, Nicholas S.; Sloan, Kenneth B.; and Pogany, Stefano A., to Merck & Co., Inc. Prodrugs of 6-mercaptopurine and 6-mercaptopurine ribosides and therapeutic compositions and methods employing them. 4,443,435, Cl. 424-180.000.
Boehringer Mannheim GmbH: *See*—
Witte, Ernst-Christian; Wolfe, Hans P.; Stegmeier, Karlheinz; and Roesch, Egon, 4,443,477, Cl. 424-319.000.
Boeing Company, The: *See*—
Erdmann, Joachim C.; and Gellert, Robert I., 4,443,103, Cl. 356-152.000.
Boelema, Sikko J. A.; Post, Martin F. M.; and Sie, Swan T., to Shell Oil Company. Process for the preparation of organic compounds. 4,443,561, Cl. 518-704.000.
Boetto, Lorenzo. Tool holder with means for radial adjustment. 4,443,140, Cl. 408-147.000.
Boev, Vladimir S.; Golev, Sergei P.; Dmitriev, Viktor I.; Pevzner, Efim M.; Yaure, Andrei G.; and Masandilov, Lev B. Method of controlling speed of at least one induction motor and device therefor. 4,443,748, Cl. 318-732.000.
Bogeso, Klaus P., to Kefalas A/S. Indane derivatives, pharmaceutical compositions thereof and method of preparation. 4,443,448, Cl. 424-250.000.
Bohonos, Donald E.: *See*—
Walwyn, Craig M.; and Bohonos, Donald E., 4,443,098, Cl. 355-74.000.
Bolick, Martha E.; Weber, Rebecca J.; and Lang, Theodore B., to Kimberly-Clark Corporation. Bib. 4,442,552, Cl. 2-49.00R.
Boliden Aktiebolag: *See*—
Wiklund, Johan E., 4,443,417, Cl. 423-210.000.
Bonassi, Luciano, to C.M.L. Costruzioni Meccaniche Lamazzo S.p.A. Lock for boat hatches operable both from inside and outside. 4,443,032, Cl. 292-202.000.
Bongianni, Wayne L., to United States of America, Energy. Microscope and method of use. 4,442,714, Cl. 73-606.000.
Bonnekamp, Horst; Sauer, Baldur; Wolkewitz, Heinrich; Hepp, Gunter; and Kraemer, Walter, to Wistra GmbH Thermoprozesstechnik. Process and apparatus for igniting a sinter mix. 4,443,184, Cl. 432-13.000.
Bononi, Walter H. Device for lens bows of eyeglasses. 4,443,073, Cl. 351-98.000.
Bonse, Gerhard; and Schmidt, Thomas, to Bayer Aktiengesellschaft. Preparation of hydrazidines. 4,443,629, Cl. 564-226.000.
Booth, Norman E.: *See*—
Cook, Earl H.; and Booth, Norman E., 4,442,802, Cl. 123-25.00L.
Booth, Stephen R.: *See*—
Schutt, William R.; and Booth, Stephen R., 4,442,903, Cl. 166-385.000.
Boots Company Limited, The: *See*—
Jeffery, James E.; and Wilmshurst, Eric C., 4,443,449, Cl. 424-250.000.
Born, Eberhard: *See*—
Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, 4,443,132, Cl. 405-260.000.
Borsh, Richard J.; Neff, Steven W.; and Pate, Harold T., to Thyssen-Bornemisza Inc. Connector fitting for connecting corrugated conduit sections. 4,443,031, Cl. 285-419.000.
Bos, Pierre H.; Musseau, Joel R.; and Rochez, Claude, to Dito-Sama. Machine for peeling and cleaning foodstuffs, particularly vegetables such as onions. 4,442,764, Cl. 99-633.000.
Boshra-Riad, Mokhtar; Fedeli, Jean-Marc; Jouve, Hubert; and Mauduit, Daniel, to Commissariat a l'Energie Atomique. Magnetic bubble store. 4,443,867, Cl. 365-19.000.
Bosse, Richard G.: *See*—
Drake, Stephen C.; and Bosse, Richard G., 4,442,620, Cl. 42-90.000.
Bosserman, David A., to United States of America. Army. Test image projector for testing imaging devices. 4,443,058, Cl. 350-294.000.
Bott, John A. Load carrier. 4,442,961, Cl. 224-42.03B.
Bottomley, Paul A.: *See*—
Edelstein, William A.; and Bottomley, Paul A., 4,443,760, Cl. 324-309.000.

Bowley, George A., to Optical Technologies, Inc. Fiber optic musical instruments. 4,442,750, Cl. 84-1.180.

Bowser-Morner, Inc.: *See*—
Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., 4,442,701, Cl. 73-32.00R.

Box Innards, Inc.: *See*—
Orlow, Ralph S., 4,442,742, Cl. 83-303.000.

Braatz, Paul O.: *See*—
Grinberg, Jan; Waldner, Michael; Braatz, Paul O.; and Jacobson, Alexander D., 4,443,064, Cl. 350-334.000.

Bradley, David J.; Eggebrecht, Lewis C.; Gibbs, Dennis S.; and Kostuch, Donald J., to International Business Machines Corporation. Page addressing mechanism. 4,443,847, Cl. 364-200.000.

Bradus, Robert: *See*—
Albrent, Gary W.; and Bradus, Robert, 4,443,137, Cl. 408-9.000.

Brahler, Thomas A.: *See*—
Whittingham, Thomas D.; Hennig, William G.; and Brahler, Thomas A., 4,442,741, Cl. 83-80.000.

Braid, Milton. Direct exchange process. 4,443,381, Cl. 260-439.00R.

Braithwaite, Charles H., Jr. Fireproof coating for wood of thermoplastic resin, alumina trihydrate and glass fibers. 4,443,520, Cl. 428-438.000.

Braitling, Joseph G.: *See*—
Wank, Larry A.; and Braitling, Joseph G., 4,443,825, Cl. 360-104.000.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,443,210, Cl. 474-199.000.

Braner Enterprises, Inc.: *See*—
Richards, Lawrence J., 4,443,147, Cl. 414-71.000.

Brault, Christian: *See*—
Legrand, Michel; Canonne, Paul; and Brault, Christian, 4,443,828, Cl. 361-93.000.

Braunschweigische Maschinenbauanstalt AG: *See*—
Schaper, Helmut; and Kurland, Heinrich, 4,443,266, Cl. 127-19.000.

Brautigam, Rolf; Wesemeyer, Jurgen; and Zobl, Hartmut, to Robert Bosch GmbH. Apparatus for creating an even illumination of a plurality of title blocks. 4,443,835, Cl. 362-300.000.

Breco Kunststoffverarbeitungs GmbH & Co. KG: *See*—
Breher, Rudolf, 4,443,396, Cl. 264-136.000.

Breher, Rudolf, to Breco Kunststoffverarbeitungs GmbH & Co. KG. Method of producing a length of flexible tubing in the form of a toothed belt and a molding tool therefor. 4,443,396, Cl. 264-136.000.

Brenholt, David L.; and Risch, Daniel T., to Donaldson Company, Inc. Self-cleaning cabinet dust collector. 4,443,235, Cl. 55-218.000.

Brenner, Friedhelm: *See*—
Eisbein, Juergen; Kaufmann, Heinrich; Moser, Kurt; and Brenner, Friedhelm, 4,443,092, Cl. 355-3.00R.

Breslow, Donald H., to Itek Corporation. Optical encoder system. 4,443,788, Cl. 340-347.00P.

Bridgestone Cycle Co., Ltd.: *See*—
Ishibashi, Hideyuki, 4,443,023, Cl. 280-278.000.
Kozakae, Kunitoshi, 4,443,208, Cl. 474-82.000.

Bridgestone Tire Company Limited: *See*—
Adachi, Masami; Shimasaki, Hirato; Nomizu, Isao; and Matsuzaki, Taketo, 4,442,791, Cl. 118-669.000.
Takahashi, Masanobu, 4,442,880, Cl. 152-356.00R.

Briggs, Eugene C.: *See*—
Shaftner, Robert S.; Chambers, Norman D.; Kagan, Michael A.; and Briggs, Eugene C., 4,443,187, Cl. 432-222.000.

Brighton, Carl T.; and Black, Jonathan, to University of Pennsylvania. Distributed port bone-piercing cathode for electrically stimulated osteogenesis. 4,442,846, Cl. 128-784.000.

Brisken, Axel F.; and Smith, Lowell S., to General Electric Company. Variable frequency ultrasonic system. 4,442,715, Cl. 73-626.000.

Brissonneau et Lotz Marine: *See*—
Harvard, Jean F., 4,443,000, Cl. 254-89.00R.

British Railways Board: *See*—
Waters, John M., 4,442,709, Cl. 73-146.000.

Brittain, David R.; and Wood, Robin, to Imperial Chemical Industries PLC. Aldose reductase inhibitory pyrrole derivatives. 4,443,465, Cl. 424-273.00R.

Brock, Andrew J.; and Mandigo, Frank N., to Olin Corporation. Process for forming a protective film on Cu-Sn alloys. 4,443,274, Cl. 148-6.310.

Broning, Manfred: *See*—
Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, 4,442,563, Cl. 12-145.000.

Brost, Robert L.: *See*—
Draper, Homer L.; Holland, Floyd H.; and Brost, Robert L., 4,443,570, Cl. 524-62.000.

Brower, Bernard C.; and Wastell, Trevor T., to A. W. Manufacturing Inc. Method and apparatus for removing gills, viscera and kidney from head on fish. 4,442,569, Cl. 17-52.000.

Brown, Boveri & CIE AG: *See*—
Hasenauer, Dieter, 4,443,525, Cl. 429-102.000.
Hasennauer, Dieter, 4,443,523, Cl. 429-99.000.
Meinhold, Henner; and Hasenauer, Dieter, 4,443,524, Cl. 429-99.000.

Brown, Charles W.: *See*—
Brown, Harry J.; Forgeng, William D.; and Brown, Charles W., 4,443,255, Cl. 75-251.000.

Brown, Harry J.; Forgeng, William D.; and Brown, Charles W., to Union Carbide Corporation. Hard facing of metal substrates. 4,443,255, Cl. 75-251.000.

Brown, Henry M., to Anderson Strathclyde Limited. Mineral cutter tool having water emission deflection surface. 4,443,038, Cl. 299-81.000.

Browne, Lloyd E., to J. T. Baker Chemical Co. Method and apparatus for forming a collapsible trap for flying insects. 4,442,624, Cl. 43-107.000.

Brownlie, Alan W.: *See*—
Sugarman, Edward D.; and Brownlie, Alan W., 4,443,005, Cl. 269-328.000.

Brownstein, Michael J.: *See*—
Sherwood, Nancy M.; Eiden, Lee E.; Brownstein, Michael J.; Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,443,368, Cl. 260-112.5LH.

Broze, Guy; and Laitem, Leopold, to Colgate-Palmolive Company. Silicate-free bleaching and laundering composition. 4,443,352, Cl. 252-94.000.

Bruce, Barbara J.: *See*—
Fraser, Thomas H.; and Bruce, Barbara J., 4,443,539, Cl. 435-68.000.

Brueninghaus Hydraulik GmbH: *See*—
Berthold, Heinz, 4,443,160, Cl. 417-270.000.

Brulard, Andre T.; and Gerbaux, Andre A., to Althouse Tertre, S.A. Trisazo black dyes. 4,443,371, Cl. 260-169.000.

Brundige, William L., to U.S. Philips Corporation. Method for making amalgam pellets. 4,443,390, Cl. 264-13.000.

Brune, Robert A., Jr.: *See*—
Floyd, Johnnie E.; and Brune, Robert A., Jr., 4,442,823, Cl. 124-78.000.

Brunn, Horst: *See*—
Hund, Franz; Hennings, Willi; Brunn, Horst; Kresse, Peter; and Rambold, Wolfgang, 4,443,264, Cl. 106-292.000.

Brunswick Corporation: *See*—
Hinds, Edward T., 4,443,671, Cl. 200-81.00R.
Hofmann, Gloris R., 4,443,047, Cl. 339-26.000.

Bubik, Alfred; and Reutter, Siegfried, to Escher Wyss GmbH. Paper making machine with a filter cylinder. 4,443,300, Cl. 162-306.000.

Bubley, Henry J., to American Screen Printing Equipment Company. Screen tensioning apparatus. 4,442,772, Cl. 101-127.100.

Buchanan, Thomas M.; Pearce, William; and Chen, Kirk C. S., to United States of America, Health and Human Services. Neisseria gonorrhoeae vaccine. 4,443,431, Cl. 424-92.000.

Bucher, Robert: *See*—
Speich, Francisco; and Bucher, Robert, 4,442,869, Cl. 139-71.000.

Buchholz, Albert; Hesse, Werner; and Moller, Gunther, to Gildemeister AG. Apparatus for adjusting two end positions limiting a clamping stroke. 4,443,021, Cl. 279-4.000.

Buchner, Klaus; and Saugeon, Ulrich, to Siemens Aktiengesellschaft. Ultrasonic signal apparatus with multiplexer for selectively loading video line segments into a parallel-partitioned image store. 4,443,862, Cl. 364-900.000.

Buck, Robert T., to Allis-Chalmers Corporation. Harvester air intake screen and access door with opening and closing mechanism. 4,442,847, Cl. 130-27.00Z.

Buckmann, Andreas, to Gesellschaft fur biotechnologische forschung mbH (GBF). Process for the production of adenine ring system containing co-enzymes bound to macromolecules. 4,443,594, Cl. 536-27.000.

Buckwalter, Brian L.; and LaHann, Thomas R., to Procter & Gamble Company, The. Carbamate derivatives. 4,443,473, Cl. 424-300.000.

Bud Antle, Inc.: *See*—
Armstrong, Errol C.; Hanacek, William A.; and Spinetti, Thomas A., 4,443,151, Cl. 414-404.000.

Buffalo Color Corporation: *See*—
Nagpal, Krishen L., 4,443,474, Cl. 424-309.000.

Buford, Sidney P.: *See*—
Helman, Edward R.; Helman, Herbert A.; Holtschneider, Henry B.; Buford, Sidney P.; Fava, Donald C.; and Christopher, Jeffrey N., 4,442,827, Cl. 126-430.000.

Buhler, Karl, to BBC Brown, Boveri & Company, Ltd. Liquid cooling arrangement for industrial furnaces. 4,443,188, Cl. 432-233.000.

Buhler, Karl; and Oldani, Karl, to BBC Brown, Boveri & Company, Ltd. Liquid-cooled cover for arc furnaces. 4,443,880, Cl. 373-74.000.

Buhrmann, Gerardus P.: *See*—
Kreijger, Pieter J.; and Buhrmann, Gerardus P., 4,443,252, Cl. 75-48.000.

Bui, Ngoc C., to Asulab, S.A. Multiplexed electrical signal processor. 4,443,757, Cl. 324-77.00B.

Bundy Corporation: *See*—
DeSaw, Fred A., 4,443,677, Cl. 219-8.500.

Burbage, Charles H.: *See*—
Hahs, Charles A.; and Burbage, Charles H., 4,442,861, Cl. 137-595.000.

Burger, Bernd: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,443,587, Cl. 526-146.000.

Burger, Hans, to Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co. Crank drive for soil compacting apparatus. 4,442,731, Cl. 74-571.00R.

Burgiss, Samuel G., Sr., to Corning Glass Works. Automatic device selection circuit. 4,443,866, Cl. 364-900.000.

Burkes, William M., Jr.; and Miller, William H., to Hercules Incorporated. Nozzle/valve device for a ducted rocket motor. 4,442,669, Cl. 60-251.000.

Burket, Richard S.; Conaghan, Brian F.; and Hirshburg, Robert, to Du Pont de Nemours, E. I., and Company. Coating method. 4,443,504, Cl. 427-445.000.

Burkhart, Johann: *See*—
Rall, Bernhard; Burkhart, Johann; and Schluter, Klaus, 4,443,773, Cl. 333-104.000.

Burns, Lyle D., to Phillips Petroleum Company. Polyolefin stabilizers. 4,443,572, Cl. 524-120.000.

Burroughs Corporation: *See*—
Harris, Craig W., 4,443,850, Cl. 364-200.000.
Hazel, Robert L.; and LaBudde, Edward V., 4,443,870, Cl. 369-44.000.
Poccia, Michael J., 4,442,726, Cl. 74-117.000.

Burt, Johanna. Hand racket for ball game with signal-generating means. 4,443,013, Cl. 273-318.000.

Busch, Dennis G.; Grafe, Robert J.; and Leikam, Gary E., to International Business Machines Corporation. Timer driven display updating. 4,443,863, Cl. 364-900.000.

Bush, James H.: *See*—
Martin, Samuel A.; Bakker, Fredrick J.; Hungerink, Gerald W.; Gisinger, Jack L.; and Bush, James H., 4,443,025, Cl. 280-407.000.

Bush, Randall G., to Sunbeam Plastics Corporation. Child-resistant and tamper indicating overcap. 4,442,955, Cl. 222-153.000.

Busseniers, Roger; and Deudon, Martial, to N.V. Biscuits Delacre S.A. Device for transferring from a conveying belt, goods such as but not exclusively, biscuits. 4,442,657, Cl. 53-500.000.

Butera, Anthony W. Doweling jig. 4,443,138, Cl. 408-115.00R.

Buthe, Theo; and Mikeska, Felix, to Jean Walterscheid GmbH. Protective device for drive shaft universal joint assembly. 4,443,207, Cl. 464-172.000.

Butler, John L.; and Clark, Arthur. Hybrid piezoelectric and magnetostrictive acoustic wave transducer. 4,443,731, Cl. 310-334.000.

Butler Manufacturing Company: *See*—
Flachbarth, Charles T.; Benscoter, Richard D.; and Sheridan, James E., 4,443,654, Cl. 174-48.000.

Buxton, James L.: *See*—
Wilson, David A.; and Buxton, James L., 4,442,713, Cl. 73-599.000.

Bycosin AB: *See*—
Holm, Kurt A., 4,442,851, Cl. 134-106.000.

Byrne, Richard F.; and Pierce, Samuel E., to Jarvis A. N. Z. Pty. Limited. Horn and bone cutting device. 4,442,602, Cl. 30-180.000.

C.G.J. Inc.: *See*—
Amici, Carmine J., 4,442,824, Cl. 126-14.000.

C.M.I. Costruzioni Meccaniche Lamazzo S.p.A.: *See*—
Bonassi, Luciano, 4,443,032, Cl. 292-202.000.

C. R. Bard, Inc.: *See*—
Meisch, Charles E.; and Keating, David M., 4,443,219, Cl. 604-317.000.

C.S.E. Automation Engineering & Services, Inc.: *See*—
Taylor, Donald K., 4,442,860, Cl. 137-557.000.

Cain, Earl S.; Carlson, Jerome A.; and Barger, William L., to Tribotech. Bearing mount and method of mounting a bearing therein. 4,443,044, Cl. 384-428.000.

Calgon Corporation: *See*—
Sopp, Samuel W.; Lee, Leonard S.; and Howe, Michael W., 4,443,425, Cl. 423-635.000.

Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., to Standard Oil Company, The. Method for the preparation of high activity phosphomolybdic acid based catalysts. 4,443,555, Cl. 502-211.000.

Callahan, Thomas: *See*—
Donarumma, Angelo; and Callahan, Thomas, 4,443,481, Cl. 426-82.000.

Callihan, Rudy B.; and Wainwright, Clyde, to Baker Oil Tools, Inc. Unitary float valve and wiping plug retainer. 4,442,894, Cl. 166-156.000.

Calnor of El Paso: *See*—
Hall, Norman M., Jr., 4,443,793, Cl. 340-634.000.

Calvino, Ben J., to Westinghouse Electric Corp. Circuit interrupter closing resistance mechanism. 4,443,674, Cl. 200-144.0AP.

Cam Fran Tool Co., Inc.: *See*—
Bandurski, Paul S., 4,443,284, Cl. 156-212.000.

Cambridge, Edward L.: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and DeAngelis, Thomas P., 4,443,313, Cl. 204-240.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Reichert, James K.; and Stott, Michael A., 4,443,767, Cl. 328-155.000.
Samson, J. E. Benoit; Duncan, Lawrence W.; and Steffler, Jean C., 4,442,838, Cl. 128-369.000.

Canon Denshi Kabushiki Kaisha: *See*—
Ono, Keikichi; and Hirano, Hirofumi, 4,443,123, Cl. 400-145.200.
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,443,826, Cl. 360-113.000.

Canon Kabushiki Kaisha: *See*—
Hosoe, Kazuya; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; Kawabata, Takashi; and Ito, Tadashi, 4,443,086, Cl. 354-409.000.
Kanbe, Junichiro; Shirai, Shigeru; and Fukuda, Tadaji, 4,443,529, Cl. 430-65.000.
Kitamura, Takashi, 4,443,695, Cl. 250-205.000.
Matsuoka, Kazuhiko; and Minoura, Kazuo, 4,443,055, Cl. 350-6.500.
Miyakawa, Hideaki; Takahashi, Yasuki; and Hata, Fumio, 4,443,090, Cl. 354-289.120.
Niwa, Yukichi; Ogino, Yasuo; Ohwada, Mitsutoshi; Tanaka, Kazuo; and Koumura, Noboru, 4,443,078, Cl. 354-403.000.
Ohtaka, Keiji, 4,443,088, Cl. 354-200.000.
Ozawa, Toshiaki, 4,443,124, Cl. 400-185.000.
Sakurai, Atsushi, 4,443,794, Cl. 340-748.000.
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,443,826, Cl. 360-113.000.
Sunouchi, Akio; Konno, Tatsuo; Fujino, Masahisa; and Suzuki, Ryuji, 4,443,089, Cl. 354-214.000.
Suzuki, Takashi, 4,443,081, Cl. 354-479.000.

Canonne, Paul: *See*—
Legrand, Michel; Canonne, Paul; and Brault, Christian, 4,443,828, Cl. 361-93.000.

Capella, Joseph A.; and Fowler, David E., to Health Physics Systems, Inc. Tool decontamination method. 4,443,269, Cl. 134-12.000.

Cappe, Carl, to NYA Asfalt AB. Procedure and arrangement for laying the foundation of prefabricated plants ashore. 4,442,651, Cl. 52-745.000.

Capt. Conners Inc.: *See*—
Conners, Craig, 4,442,786, Cl. 114-255.000.

Carl Freudenberg, Firma: *See*—
Beffart, Hans; and Ries, Hans M., 4,442,686, Cl. 68-198.000.
Peschges, Klaus-Jurgen, 4,443,145, Cl. 411-542.000.

Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See*—
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Carlson, Jerome A.: *See*—
Cain, Earl S.; Carlson, Jerome A.; and Barger, William L., 4,443,044, Cl. 384-428.000.

Carlsson, Kurt B. I., to Flakt Aktiebolag. Device at a dust filter. 4,443,234, Cl. 55-126.000.

Carlsson, Sune J. R. Apparatus for emptying single or multi-walled packages. 4,442,956, Cl. 222-185.000.

Carnegie, Alistair L., to Normalair-Garrett (Holdings) Limited. Deep diving breathing systems. 4,442,835, Cl. 128-201.270.

Carr, Albert A.; and Farr, Robert A., to Merrell Dow Pharmaceuticals Inc. Antipsychotic 4-(naphthalenyloxy)piperidine derivatives. 4,443,462, Cl. 424-267.000.

Carson, Charles, to Fort Wayne Wire Die, Inc. Method for mounting hard wear-resistant inserts. 4,442,734, Cl. 76-107.00A.

Carson, Don B., to UOP Inc. Moving bed gas treating process. 4,443,419, Cl. 423-244.000.

Cartner, Jack O. Trailing wing mower. 4,442,658, Cl. 56-11.900.

Casady, Philip M.: *See*—
Migliori, Albert; and Northup, Stephen D., 4,443,837, Cl. 362-396.000.

Casper, Rudolf: *See*—
Musch, Rudiger; Pampus, Gottfried; Casper, Rudolf; Muller, Peter; and Gobel, Wilhelm, 4,443,583, Cl. 525-215.000.

Castonguay, Roger N., to General Electric Company. Interchangeable shield arrangement for a circuit breaker compartment. 4,443,676, Cl. 200-304.000.

Catalano, Anthony W.; and Bhushan, Manjul, to University of Delaware, The. Thin film photovoltaic device with multilayer substrate. 4,443,653, Cl. 136-265.000.

Catterfeld, Fritz C.: *See*—
Wong, George S.; Catterfeld, Fritz C.; and Hauenstein, Clifford A., 4,443,152, Cl. 415-143.000.

Cavazza, Claudio. Amides of acyl-carnitines, process for preparing same and pharmaceutical compositions containing such amides. 4,443,475, Cl. 424-311.000.

Celanese Corporation: *See*—
Ying, Lincoln, 4,443,566, Cl. 523-205.000.

Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See*—
Ramelot, Daniel, 4,442,699, Cl. 73-28.000.

Centre National de la Recherche Scientifique: *See*—
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Centre Technique de l'Industries des Papiers Carton et Celluloses: *See*—
Julien Saint Amand, Francois, 4,443,331, Cl. 209-211.000.

Chait, Edward M.; Gianelli, Mary L.; and Johnson, Donald R., to Du Pont de Nemours, E. I., and Company. Device for electrophoresis. 4,443,319, Cl. 204-299.00R.

Chambers, Norman D.: *See*—
Shaftner, Robert S.; Chambers, Norman D.; Kagan, Michael A.; and Briggs, Eugene C., 4,443,187, Cl. 432-222.000.

Chance, Allan; and Gray, William T. Champagne cork puller. 4,442,735, Cl. 81-3.440.

Chant, Patrick: *See*—
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,443,633, Cl. 568-445.000.

Chanton, Edmond, to Societe Generale de Mecanique et de Metallurgie. Moineau pump with helicoidal coupling sleeve. 4,443,165, Cl. 418-48.000.

Chaphalkar, Dhananjay V.: *See*—
Beiswenger, John L.; Smiesko, Frank A.; and Chaphalkar, Dhananjay V., 4,442,977, Cl. 239-332.000.

Chapman, Raymond C.: *See*—
Hoover, John W.; Chapman, Raymond C.; Dammassa, Dominick F.; and Rutkowski, Richard G., 4,443,827, Cl. 360-132.000.

Chappell, Anthony G., to Wellcome Australia Limited. Fluid pump. 4,443,216, Cl. 604-67.000.

Chatas, Angelos T.: *See*—
Padilla, Joseph R.; Richardson, Emmett M.; and Chatas, Angelos T., 4,442,900, Cl. 166-342.000.

Chausse, B. Paul; Espelage, Paul M.; Lippitt, David L.; and Tupper, Leland C., to General Electric Company. Transitioning between

multiple modes of inverter control in a load commutated inverter motor drive. 4,443,747, Cl. 318-723.000.

Cheetham, Peter S. J., to Tate & Lyle Public Limited Company. Stabilization of immobilized enzymes with glycerol. 4,443,538, Cl. 435-41.000.

Chem-Y Fabriek Van Chemische Producten B.V.: *See—*
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Chemical Research & Licensing Company: *See—*
Smith, Lawrence A., Jr., 4,443,559, Cl. 502-527.000.

Chen, Hsing-Yao, to RCA Corporation. Electron gun for dynamic beam shape modulation. 4,443,736, Cl. 313-414.000.

Chen, Kirk C. S.: *See—*
Buchanan, Thomas M.; Pearce, William; and Chen, Kirk C. S., 4,443,431, Cl. 424-92.000.

Chen, Nai Y.; and Rankel, Lillian A., to Mobil Oil Corporation. Conversion of residua to premium products via thermal treatment and coking. 4,443,325, Cl. 208-55.000.

Chen, Shih-Heui: *See—*
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Chenausky, Peter P.; and Newman, Leon A., to United Technologies Corporation. Uniformly excited RF waveguide laser. 4,443,877, Cl. 372-38.000.

Chervan, Munir; and Deeslie, William D., to University of Illinois Foundation. Protein hydrolysis. 4,443,540, Cl. 435-69.000.

Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., to James River-Dixie/Northern, Inc. Apparatus and method for the manufacture of a non-woven fibrous web. 4,443,297, Cl. 162-101.000.

Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., to James River-Dixie/Northern, Inc. Apparatus and method for the manufacture of a non-woven fibrous web. 4,443,299, Cl. 162-264.000.

Chevron Research Company: *See—*
Field, Leslie A., 4,443,326, Cl. 208-64.000.
Gibson, Kirk R., 4,443,558, Cl. 502-314.000.
Laxo, Darryl E., 4,443,029, Cl. 285-93.000.
Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, 4,443,372, Cl. 260-239.00A.
Sageman, David; and Mitchell, David S., 4,443,229, Cl. 48-197.00R.
Yamaguchi, Elaine S.; and Liston, Thomas V., 4,443,360, Cl. 252-46.700.

Chiang, Robert L.; and Scherzer, Julius, to Harshaw/Filtrol Partnership. Production of fluid catalytic cracking catalysts. 4,443,553, Cl. 502-68.000.

Chicago Bridge & Iron Company: *See—*
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., 4,442,679, Cl. 62-123.000.

Chicago Roller Skate Company, The: *See—*
Ware, Gordon K., 4,443,022, Cl. 280-11.280.

Chikuzenya, Takao: *See—*
Ainoya, Masayuki; Kozawa, Hiroomi; and Chikuzenya, Takao, 4,443,091, Cl. 355-3.0TR.

Child, Francis W., to Child Laboratories Inc. Clipboard and shield. 4,442,780, Cl. 109-29.000.

Child Laboratories Inc.: *See—*
Child, Francis W., 4,442,780, Cl. 109-29.000.

Children's Hospital Medical Center: *See—*
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Chin, Aland K.; and Dutt, Bulusu V., to AT & T Bell Telephone Laboratories, Incorporated. p-i-n Photodiodes. 4,443,809, Cl. 357-16.000.

Chiyoda Chemical Engineering & Constr., Co., Ltd.: *See—*
Miyoshi, Hajime; Asanagi, Etsuo; Iguchi, Junsuke; and Okabayashi, Ikuo, 4,443,260, Cl. 106-109.000.

Chloride Silent Power Limited: *See—*
Riley, David J.; and McGreavy, Gerald, 4,443,172, Cl. 425-112.000.

Cholod, Michael S.: *See—*
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Chono, Tadashi: *See—*
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Moriyama, Satoru; Chono, Tadashi; and Uchiyama, Tsugio, 4,443,439, Cl. 424-211.000.

Christopher, Jeffrey N.: *See—*
Helman, Edward R.; Helman, Herbert A.; Holtschneider, Henry B.; Buford, Sidney P.; Fava, Donald C.; and Christopher, Jeffrey N., 4,442,827, Cl. 126-430.000.

Ciba-Geigy AG: *See—*
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,443,537, Cl. 430-566.000.

Ciba-Geigy Corporation: *See—*
Farooq, Saleem; and Streibert, Hans-Peter, 4,443,445, Cl. 424-246.000.
Fory, Werner; Gass, Karl; Meyer, Willy; and Schurter, Rolf, 4,443,243, Cl. 71-93.000.
Kunz, Walter; Eckhart, Wolfgang; and Hubele, Adolf, 4,443,618, Cl. 549-320.000.
Meyer, Willy; and Fory, Werner, 4,443,245, Cl. 71-93.000.
Puntener, Alois, 4,443,370, Cl. 260-145.00B.
Rempfler, Hermann; and Fory, Werner, 4,443,247, Cl. 71-94.000.

Cimarusti, Christopher M.; Fox, Rita T.; Fritz, Alan W.; Koster, William H.; and Moniot, Jerome L., to E. R. Squibb & Sons, Inc. Process for preparing (3S)-3-[[(2-amino-4-thiazolyl)[(1-carboxy-1-methylethoxy)imino]-acetyl]amino]-2-oxo-1-azetidinesulfonic acid, and 4-substituted derivatives. 4,443,374, Cl. 260-245.400.

Citizen Watch Company Limited: *See—*
Togashi, Seigo; Tsuzuki, Akira; and Fujita, Hiro, 4,443,062, Cl. 350-332.000.
Yoshida, Makoto; Watanabe, Shinichi; and Suzuki, Fuminori, 4,443,116, Cl. 368-202.000.

Clarence Zierhut Incorporated: *See—*
Zierhut, Clarence D., 4,442,565, Cl. 15-27.000.

Clark, Arthur: *See—*
Butler, John L.; and Clark, Arthur, 4,443,731, Cl. 310-334.000.

Clark, Frederick G., to Eastman Machine Company. Sharpener construction for fabric cutting machine. 4,442,599, Cl. 30-139.000.

Clark, James M.: *See—*
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., 4,443,314, Cl. 204-243.00R.

Clark, Leland C., Jr., to Children's Hospital Medical Center. Artificial blood and other gas transport agents. 4,443,480, Cl. 424-352.000.

Clark & Vicario Corporation: *See—*
Kaiser, Robert G., 4,443,232, Cl. 55-41.000.

Clausen, Allan H., to Continental Custom Bridge Company. Vehicle frame measurement device. 4,442,608, Cl. 33-288.000.

Cleeves, James M.: *See—*
Radigan, Kenneth J.; and Cleeves, James M., 4,443,295, Cl. 156-657.000.

Clemens, Robert M. Carrier apparatus for fire fighters. 4,442,557, Cl. 5-82.00R.

Cliff, William C.: *See—*
Apley, Walter J.; Cliff, William C.; and Creer, James M., 4,442,720, Cl. 73-863.310.

Clinicon Mannheim GmbH: *See—*
Meinecke, Dieter; Schmidt, Werner; Schussler, Rudolf; and van Rijckevorsel, Rainer, 4,442,836, Cl. 128-314.000.

Coal Industry (Patents) Limited: *See—*
Pidgeon, Brian G.; and Bavington, Clive R., 4,443,792, Cl. 340-612.000.

Cocco, Vincent L.: *See—*
Cronin, David V.; and Cocco, Vincent L., 4,443,530, Cl. 430-138.000.

Coe, Charles F.; and Parra, Gilbert T., to United States of America, National Areonautics and Space Administration. Electronic scanning pressure measuring system and transducer package. 4,442,716, Cl. 73-756.000.

Colas, Claude: *See—*
de Sivry, Bruno; Migliarese-Caputi, Jean-Louis; Herve Guy; and Colas, Claude, 4,443,129, Cl. 405-170.000.

Colgate-Palmolive Company: *See—*
Broze, Guy; and Laitem, Leopold, 4,443,352, Cl. 252-94.000.
Delvaux, Myriam, 4,443,512, Cl. 428-162.000.
Hauschild, John P.; and Principe, Joseph R., 4,443,564, Cl. 523-105.000.

Collins, Guy R., to Dow Chemical Company, The. Salvage of polycarbonate wastes by conversion to monomeric hydroxycarbamoyl phenols. 4,443,593, Cl. 528-210.000.

Collins, Walter W., to Jenkins Metal Corporation. Utility knife. 4,442,559, Cl. 7-158.000.

Colt Industries Operating Corp: *See—*
Ho, Kuang-Ta, 4,443,682, Cl. 219-69.00C.

Combustion Engineering, Inc.: *See—*
Pajonas, Thomas L.; Barcikowski, Gerald F.; and Ennaco, Andrew J., 4,442,783, Cl. 110-347.000.

Cominco Ltd.: *See—*
Kerby, Robert C., 4,443,301, Cl. 204-1.00T.

Commissariat a l'Energie Atomique: *See—*
Boshra-Riad, Mokhtar; Fedeli, Jean-Marc; Jouve, Hubert; and Mauduit, Daniel, 4,443,867, Cl. 365-19.000.

Compagnie Francaise des Petroles: *See—*
de Sivry, Bruno; Migliarese-Caputi, Jean-Louis; Herve Guy; and Colas, Claude, 4,443,129, Cl. 405-170.000.
de Sivry, Bruno J. M.; Migliarese-Caputi, Jean-Louis; and Josien, Daniel, 4,442,867, Cl. 138-93.000.

Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme): *See—*
De Pommery, Bertrand J. C. H.; and Goupil, Jean-Paul C., 4,443,049, Cl. 339-75.0MP.

Compton, Leslie E., to United States of America, National Aeronautics and Space Administration. Supercritical solvent coal extraction. 4,443,321, Cl. 208-8.0LE.

Conaghan, Brian F.: *See—*
Burket, Richard S.; Conaghan, Brian F.; and Hirshburg, Robert, 4,443,504, Cl. 427-445.000.

Congoleum Corporation: *See—*
Ehrenfeld, Frank E., Jr., 4,443,505, Cl. 428-89.000.

Conn, Francis E., to General Motors Corporation. Gas turbine engine fuel control system. 4,442,668, Cl. 60-39.281.

Conn, George E.; and Spector, George. Centrifugal switch for controlling belt hauling systems. 4,442,933, Cl. 198-502.000.

Conners, Craig, to Capt. Conners Inc. Fishing vessel. 4,442,786, Cl. 114-255.000.

Conoco Inc.: *See—*
Fair, Delbert W., 4,442,916, Cl. 181-120.000.
Yates, James A., 4,443,638, Cl. 568-882.000.
Ziegenhain, William C.; and Horton, Gary L., 4,443,634, Cl. 568-621.000.

Conradi, Robert A.: *See—*
Anderson, Bradley D.; and Conradi, Robert A., 4,443,440, Cl. 424-243.000.

Container Corporation of America: *See*—
Helms, Charles R., 4,442,971, Cl. 229-43.000.
Continental Custom Bridge Company: *See*—
Clausen, Allan H., 4,442,608, Cl. 33-288.000.
Continental Group, Inc., The: *See*—
Turner, Howard M., 4,443,401, Cl. 264-544.000.
Walter, John; and Kubis, Charles S., 4,442,693, Cl. 72-354.000.
Continental White Cap, Inc.: *See*—
Banich, John N., Sr., 4,442,947, Cl. 215-344.000.
Contrepois, Michel G.: *See*—
Gouet, Philippe; Contrepois, Michel G.; Dubourguier, Henri-Charles; Girardeau, Jean-Pierre; Goby, Hubert L. J.; Goby, Therese M.; Goby, Anne M.; and Goby, Genevieve, 4,443,547, Cl. 435-253.000.
Cook, Earl H.; and Booth, Norman E. Internal combustion engine water injector. 4,442,802, Cl. 123-25.00L.
Cook, Thomas G., to Dow Chemical Company, The. Process for removing copper and copper oxide encrustations from ferrous surfaces. 4,443,268, Cl. 134-2.000.
Coon, Clifford L.; Harrar, Jackson E.; Pearson, Richard K.; and McGuire, Raymond R., to United States of America, Energy. Method and apparatus for synthesizing anhydrous HNO_3. 4,443,308, Cl. 204-103.000.
Cooney, Charles L.: *See*—
Langer, Robert S., Jr.; Linhardt, Robert; Cooney, Charles L.; and Galliher, Parrish M., 4,443,545, Cl. 435-232.000.
Cooper Industries: *See*—
Kosmowski, Wojciech B., 4,443,141, Cl. 409-163.000.
Cope, James R. Fishing rod wrapping device. 4,442,981, Cl. 242-7.190.
Copes, Arthur. Biomechanical ankle device. 4,442,554, Cl. 3-35.000.
Coq, Jean-Louis G.; and Seymus, Herman E., to Du Pont de Nemours, E. I., and Company. Coating composition of poly(arylene sulfide), polytetrafluoroethylene and barium or calcium sulfate. 4,443,574, Cl. 524-423.000.
Coquin, Jean-Claude. Device for holding accessories for the lenses of apparatuses for taking photographs. 4,443,061, Cl. 350-318.000.
Cormier, Alan D.: *See*—
Weinberg, Melvin S.; and Cormier, Alan D., 4,443,407, Cl. 422-68.000.
Cormier, Milton J., to University of Georgia Research Foundation, Inc. Use of psychoactive drugs as vaginal contraceptives. 4,443,446, Cl. 424-247.000.
Cornell Research Foundation, Inc.: *See*—
Kuckes, Arthur F., 4,443,762, Cl. 324-346.000.
Corning Glass Works: *See*—
Burgiss, Samuel G., Sr., 4,443,866, Cl. 364-900.000.
Cosden Technology, Inc.: *See*—
Hahn, Granville J.; and Rutledge, Raleigh N., 4,443,397, Cl. 264-171.000.
Watson, James M.; and Forward, Cleve, 4,443,643, Cl. 585-437.000.
Cote, Paul L., to Gentex Corporation. Electret microphone assembly. 4,443,666, Cl. 179-111.00E.
Coudol, Roger: *See*—
Hulin, Jean-Pierre; Fierfort, Claude; and Coudol, Roger, 4,442,711, Cl. 73-155.000.
Cowher, Melvyn E.; and Shuskus, Alexander J., to United Technologies Corporation. Method for the formation of phosphorous-nitrogen based glasses useful for the passivation of III-V semiconductor materials. 4,443,489, Cl. 427-38.000.
Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., to Bowser-Morner, Inc. Method for measuring density of a bulk material in a stockpile. 4,442,701, Cl. 73-32.00R.
Craig, Laurence B.; and Farina, Alfred J. Heat exchanger. 4,442,799, Cl. 122-250.00R.
Craigie, William A. Sofa bed with inflatable mattress. 4,442,556, Cl. 5-13.000.
Cramp, Harry D.; Blythe, Malcolm R.; and Williams, Philip D. L., to Decca Limited. Radar display apparatus. 4,443,797, Cl. 343-5.0SC.
Crane, Hewitt D., to SRI International. Stabilized visual system. 4,443,075, Cl. 351-209.000.
Creer, James M.: *See*—
Apley, Walter J.; Cliff, William C.; and Creer, James M., 4,442,720, Cl. 73-863.310.
Crommentuyn, Gerardus J.: *See*—
Heikens, Harm H.; and Crommentuyn, Gerardus J., 4,443,527, Cl. 430-39.000.
Cronin, David V.; and Cocco, Vincent L., to Polaroid Corporation. Self-processing film unit with liquid applicator. 4,443,530, Cl. 430-138.000.
Crow, Vesta J.: *See*—
MacDonald, Christopher; and Crow, Vesta J., 4,442,946, Cl. 215-230.000.
Crowell, Ronald F., to Standard Oil Company. Formation fracturing method. 4,442,897, Cl. 166-280.000.
Crown Cork & Seal Company, Inc.: *See*—
Yun, Chung J., 4,442,873, Cl. 141-39.000.
Cuminale, Raymond J.; Otto, Stanley W.; Knipp, Jerry L.; Seibolt, Bernard P.; and Yarkoni, Fred E., to Hallmark Cards, Inc. Carded merchandise display. 4,442,942, Cl. 211-163.000.
Cunningham, David J. Rotary magnet device. 4,443,776, Cl. 335-302.000.
Cure, Omer P. I., to Electro-Nite Co. Method of determining the carbon content of steel melts by thermal analysis. 4,443,118, Cl. 374-26.000.
Curran, Steven H.; and Kumalae, Alfred G. Boat platform having outboard and inboard positions. 4,442,787, Cl. 114-363.000.
Cutter, James W., to Litton Industrial Products, Inc. SID Monitor. 4,443,888, Cl. 378-151.000.
Cutter Laboratories, Inc.: *See*—
Dahlen, Burton L.; Odne, L. John; and Ryan, John D., 4,442,833, Cl. 128-90.000.
Czerwinski, Watson P.: *See*—
DeSantis, Charles M.; Zannella, Albert H.; Begala, Michael W.; Wills, John R.; and Czerwinski, Watson P., 4,443,803, Cl. 343-749.000.
Dahlen, Burton L.; Odne, L. John; and Ryan, John D., to Cutter Laboratories, Inc. Casting or splinting package. 4,442,833, Cl. 128-90.000.
Dahlstrom, Robert V., to Stauffer Chemical Company. Method for preservation of meat products. 4,443,484, Cl. 426-266.000.
Dai Nippon Toryo Co., Ltd.: *See*—
Hoshino, Minoru; Shinohara, Tosio; Tanabe, Hiroyuki; Taki, Tooru; and Nakayama, Shunsuke, 4,443,503, Cl. 427-421.000.
Daicel Chemical Industries Ltd.: *See*—
Namikoshi, Hajime; Okumura, Yoshiaki; and Sei, Tsuyoshi, 4,443,595, Cl. 536-58.000.
Dailey, Inc.: *See*—
Teng, Chuan C., 4,443,206, Cl. 464-20.000.
Dainichi Kogyo Co., Ltd.: *See*—
Yoshii, Hisao, 4,443,157, Cl. 417-45.000.
Dainippon Pharmaceutical Company Limited: *See*—
Sunahara, Noriyuki; Naruto, Shunsuke; Kagemoto, Akira; Kurooka, Shigeru; and Yokogawa, Kanae, 4,443,365, Cl. 260-112.00R.
Daiwa Can Company, Limited: *See*—
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Wakamatsu, Atsuyuki; and Tsuwano, Haruo, 4,442,654, Cl. 53-266.00R.
Dalibard, Gerard; and Viaud, Nicole, to Societe Anonyme dite Compagnie Europeene d'Accumulateurs. Lead-antimony alloys for electrode supports for lead accumulators. 4,443,405, Cl. 420-573.000.
Dammassa, Dominick F.: *See*—
Hoover, John W.; Chapman, Raymond C.; Dammassa, Dominick F.; and Rutkowski, Richard G., 4,443,827, Cl. 360-132.000.
Damon, Richard: *See*—
Bishop, Robert; and Damon, Richard, 4,443,855, Cl. 364-513.000.
Dana Corporation: *See*—
Shah, Kanu G., 4,443,517, Cl. 428-281.000.
Danfoss A/S: *See*—
Graversen, Niels P. G.; and Pedersen, Svend P., 4,443,120, Cl. 374-201.000.
Danks, Jack. Sports footwear. 4,442,615, Cl. 36-133.000.
D'Anna, Michael A. Door securing apparatus and methods of constructing and utilizing same. 4,443,033, Cl. 292-235.000.
Dantlgraber, Jorg, to Mannesmann-Rexroth GmbH. Power control device for pumps. 4,443,159, Cl. 417-220.000.
Darko, Laszlo L., to Richter Gedeon Vegyeszeti Gyar R.T. Method of treating mammals for effects of neuro- and cardiovascular toxins. 4,443,472, Cl. 424-282.000.
Darling, Donald F., to Lever Brothers Company. Process for producing a spreadable emulsion. 4,443,487, Cl. 426-603.000.
Datatape Incorporated: *See*—
Grant, Frederic F., 4,442,963, Cl. 226-97.000.
Davies, David H.; and Smithers, Michael J., to Imperial Chemical Industries PLC. Derivatives of M.139,603 useful as growth promoters. 4,443,471, Cl. 424-279.000.
Davis, George D.: *See*—
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,443,642, Cl. 585-428.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,443,641, Cl. 585-428.000.
Davis, George R.; Hildebrand, Robert; and Purcell, Harold, to Dzus Fastener Co., Inc. Self-ejecting fastener stud. 4,442,571, Cl. 411-552.000.
Dayco Corporation: *See*—
Miranti, Joseph P., Jr., 4,443,281, Cl. 156-140.000.
Standley, Paul M., 4,443,280, Cl. 156-137.000.
de Ahna, Heinz D.: *See*—
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Dean, Raymond H.; and Bader, Ghassan, to Tempmaster Corporation. Flow splitting arrangement for air conditioning terminal units. 4,442,760, Cl. 98-40.00D.
DeAngelis, Thomas P.: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and DeAngelis, Thomas P., 4,443,313, Cl. 204-240.000.
de Bode, Ronus: *See*—
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Handricus B. A., 4,443,453, Cl. 424-258.000.
DeCant, Leonard J., Jr.; and Idriss, Samir F., to Infusaid Corporation. Programmable implantable infusate pump. 4,443,218, Cl. 604-67.000.
Decca Limited: *See*—
Cramp, Harry D.; Blythe, Malcolm R.; and Williams, Philip D. L., 4,443,797, Cl. 343-5.0SC.
Deere & Company: *See*—
Kuhn, John B., 4,442,660, Cl. 56-15.900.
Peiler, Rolf, 4,443,236, Cl. 55-269.000.
Saemann, Karl L., 4,443,035, Cl. 296-190.000.
Wohlford, William P., 4,443,041, Cl. 305-43.000.

Deeslie, William D.: *See*—
Chervan, Munir; and Deeslie, William D., 4,443,540, Cl. 435-69.000.

Defrancq, Hubert. Locking pin for a spindle or similar element, more especially for agricultural equipment. 4,443,144, Cl. 411-351.000.

Degussa Aktiengesellschaft: *See*—
Fischer, Robert; and de Ahna, Heinz D., 4,443,265, Cl. 106-306.000.

deJori, Charlene K. Method for forming sgraffito patterns on ceramic surfaces. 4,443,500, Cl. 427-264.000.

Dekker, Lambert: *See*—
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,443,633, Cl. 568-445.000.

Delauder, Roscoe E. Cover for golf bag. 4,442,937, Cl. 206-315.400.

Del Bon, Franco: *See*—
Del Bon, Luigi; and Del Bon, Franco, 4,442,959, Cl. 222-402.240.

Del Bon, Luigi; and Del Bon, Franco. Self-closing valve-and-lid assembly. 4,442,959, Cl. 222-402.240.

de Leeuw, Petrus J. L. Coupling. 4,443,127, Cl. 403-175.000.

Delesandri, Domenico. Apparatus for stabbing and threading a safety valve into a well pipe. 4,442,892, Cl. 166-85.000.

Delfino, Michelangelo, to Fairchild Camera and Instrument Corp. Laser induced flow glass materials. 4,443,493, Cl. 427-53.100.

Delmag-Maschinenfabrik Reinhold Dornfeld GmbH & Co.: *See*—
Burger, Hans, 4,442,731, Cl. 74-571.00R.

DeLong, Vincent R., to Rockwell International Corporation. System and method for encrypting a voice signal. 4,443,660, Cl. 178-22.040.

del Soldato, Piero: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Schmidt, Gunther; Eberlein, Wolfgang; Hammer, Rudolf; and del Soldato, Piero, 4,443,452, Cl. 424-256.000.

Delvaux, Myriam, to Colgate-Palmolive Company. Absorbent article with densified areas. 4,443,512, Cl. 428-162.000.

Delvy, Robert J.; Pentecost, Harry L.; and Patterson, Leroy R., to Universal Manufacturing Corp. Capacitor with integral discharge resistor and method of manufacture. 4,443,829, Cl. 361-275.000.

Demidowicz, Zenon: *See*—
Taylor, Dennis R.; and Demidowicz, Zenon, 4,443,379, Cl. 260-427.000.

Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,443,617, Cl. 549-302.000.

de Nevers, Noel H., to Oros Company. Cross flow solid-to-solid heat transfer apparatus. 4,443,332, Cl. 209-331.000.

Denk, Heimo; and Mantsch, Peter, to List, Hans. Apparatus for measuring the angular position of a shaft. 4,443,787, Cl. 340-347.00P.

den Otter, Johan L., to Nederlandse Centrale Organistatie voor Toegepast Natuurwetenschappelijk Onderzoek. Method for mixing and masticating highly viscous materials. 4,443,110, Cl. 366-97.000.

Densham, Robert L. Engine oil draining assembly. 4,442,936, Cl. 200-223.000.

Denton, William S.: *See*—
Lindsey, Stanley D.; Ioannides, Socrates A.; Horner, Jack R.; Denton, William S.; Shell, Donald P.; and Bebb, Hubert, 4,442,639, Cl. 52-73.000.

Dentsply Research and Development Corporation: *See*—
Gonser, Donald I., 4,443,494, Cl. 156-64.000.

De Pommery, Bertrand J. C. H.; and Goupil, Jean-Paul C., to Compagnie Internationale pour l'Informatique CII-Honeywell Bull (Societe Anonyme). Connector for portable objects such as credit cards. 4,443,049, Cl. 339-75.0MP.

Derderian, Scott K.; and Katsekas, James C., to General Electric Company. Dynamoelectric machine stator wedge. 4,443,725, Cl. 310-214.000.

DeSantis, Charles M.; Zannella, Albert H.; Begala, Michael W.; Wills, John R.; and Czerwinski, Watson P., to United States of America, Army. Lossy matching for broad bonding low profile small antennas. 4,443,803, Cl. 343-749.000.

DeSaw, Fred A., to Bundy Corporation. Induction welding impeder apparatus with fluid cooling. 4,443,677, Cl. 219-8.500.

Design Controls Corporation: *See*—
Zamek, Paul, 4,443,100, Cl. 355-76.000.

de Sivry, Bruno; Migliarese-Caputi, Jean-Louis; Herve Guy; and Colas, Claude, to Compagnie Francaise des Petroles. Method and apparatus for tapping a submerged pipe. 4,443,129, Cl. 405-170.000.

de Sivry, Bruno J. M.; Migliarese-Caputi, Jean-Louis; and Josien, Daniel, to Compagnie Francaise des Petroles. Internal obturators for pipes. 4,442,867, Cl. 138-93.000.

Dessau, Ralph M., to Mobil Oil Corporation. Activation of alkali metal zeolite catalysts by steaming. 4,443,554, Cl. 502-71.000.

Deudon, Martial: *See*—
Busseniers, Roger; and Deudon, Martial, 4,442,657, Cl. 53-500.000.

Deutsch, Leslie J.: *See*—
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Deutsch, Ralph; and Deutsch, Leslie J., to Kawai Musical Instrument Mfg. Co., Ltd. Octave phase decoupling in an electronic musical instrument. 4,442,747, Cl. 84-1.010.

Develop Dr. Eisbein GmbH & Co.: *See*—
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de Vries, Auke F.: *See*—
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DeWitte, Jerry L.: *See*—
Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., 4,442,701, Cl. 73-32.00R.

Dholakia, Anil R., to RCA Corporation. Stylus lowering, lifting and cleaning apparatus. 4,443,871, Cl. 369-71.000.

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Diamond Shamrock Chemicals Company: *See*—
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Dibelius, Gunther. Controlled exhaust-type supercharger turbine. 4,443,153, Cl. 415-151.000.

Dictaphone Corporation: *See*—
Hoover, John W.; Chapman, Raymond C.; Dammassa, Dominick F.; and Rutkowski, Richard G., 4,443,827, Cl. 360-132.000.

Diefenbach, Berndt. Shape association sound-emitting toy. 4,443,201, Cl. 434-259.000.

Diefendorf, Russell J.; and Chen, Shih-Heui, to Exxon Research and Engineering Co. Low melting mesophase pitches. 4,443,324, Cl. 208-22.000.

Diesel Kiki Co., Ltd.: *See*—
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Dietrich, Paul: *See*—
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Dietz, Erwin; Maikowski, Michael; and Gutbrod, Robert, to Hoechst Aktiengesellschaft. Solids dispersions which can be easily distributed in hydrophobic and hydrophilic media and are stable to flocculation, and their use. 4,443,263, Cl. 106-287.240.

DiMarzio, Lawrence P.; and Blucher, Steven L., to DiMarzio Musical Instrument Pickups, Inc. Electrical pickup for a stringed instrument having ferromagnetic strings. 4,442,749, Cl. 84-1.150.

DiMarzio Musical Instrument Pickups, Inc.: *See*—
DiMarzio, Lawrence P.; and Blucher, Steven L., 4,442,749, Cl. 84-1.150.

DiMatteo, Paul; and Ross, Joseph, to Robotic Vision Systems, Inc. Method for locating points on a three-dimensional surface using light intensity variations. 4,443,705, Cl. 250-558.000.

DiMatteo, Paul; and Ross, Joseph, to Robotic Vision Systems, Inc. Method for locating points on a three-dimensional surface using light intensity variations. 4,443,706, Cl. 250-558.000.

Dinulescu, Horia A., to North Atlantic Technologies, Inc. Floating plate heat exchanger. 4,442,886, Cl. 165-76.000.

Dirlikov, Stoil K.; and Schneider, Connie J., to Dow Chemical Company, The. Polyurethanes based on 1;4-3:6 dianhydrohexitols. 4,443,563, Cl. 521-174.000.

Dito-Sama: *See*—
Bos, Pierre H.; Musseau, Joel R.; and Rochez, Claude, 4,442,764, Cl. 99-633.000.

Dixon, James N., to Wesjay, Inc. Multi-motion mechanical press. 4,443,171, Cl. 425-78.000.

Dmitriev, Viktor I.: *See*—
Boev, Vladimir S.; Golev, Sergei P.; Dmitriev, Viktor I.; Pevzner, Efim M.; Yaure, Andrei G.; and Masandilov, Lev B., 4,443,748, Cl. 318-732.000.

Dobbin, Thomas M., to Kaepa, Inc. Shoe tongue holder assembly. 4,442,613, Cl. 36-50.000.

Dr. -Ing. Rudolf Hell GmbH: *See*—
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Dr. Karl Thomae GmbH: *See*—
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Doddi, Namassivaya: *See*—
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Donaldson Company, Inc.: *See*—
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Donermeyer, Donald D.; Martins, Joseph G.; and Fabel, David A., to Monsanto Company. Bonded plastic structures. 4,443,519, Cl. 428-336.000.

Donermeyer, Donald D.: *See*—
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Doremus, Bernard; and Muller, Jean-Pierre, to Schlumberger Technology Corporation. Remote hydraulic control method and apparatus, notably for underwater valves. 4,442,902, Cl. 166-374.000.

Dorf, Arthur L.; Lovalenti, Sam; Pezzin, John J.; and Riggs, Darius O., to Owens-Illinois, Inc. Glass container inspection handling system. 4,442,934, Cl. 198-344.000.

Douglas, George H.; Studt, William L.; Dodson, Stuart A.; and Zimmerman, Harry K., to William H. Rorer, Inc. Pyridyl alkylene amidinoureas. 4,443,456, Cl. 424-263.000.
Douthart, Robert H.; and Smith, Howard W., to A. O. Smith Corporation. Multiple speed split-phase induction motor. 4,443,749, Cl. 318-774.000.
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Collins, Guy R., 4,443,593, Cl. 528-210.000.
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Eaby, Daniel G.; and Shuey, John R., to AMP Incorporated. Means to indicate fully-mated condition of electrical connector. 4,443,052, Cl. 339-113.00R.
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Edelstein, William A.; and Bottomley, Paul A., to General Electric Company. Use of phase alternated RF pulses to eliminate effects of spurious free induction decay caused by imperfect 180 degree RF pulses in NMR imaging. 4,443,760, Cl. 324-309.000.
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Strohmeyer, Charles, Jr., 4,442,796, Cl. 122-4.00D.
Strohmeyer, Charles, Jr., 4,442,797, Cl. 122-4.00D.
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Ellis, Thomas E.; Lenk, Pedro A.; and Shah, Jayantkumar R., to Stromberg-Carlson Corporation. Filtering of port data in a switching system employing interactive processors. 4,443,663, Cl. 179-18.0ES.
El-Menshawy, Mohamed F.; and Bhattacharyya, Sushantha K. Methods and apparatus for electrical discharge machining. 4,443,680, Cl. 219-69.00C.
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Emhart Industries, Inc.: *See*—
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Enbusk, Henry J. Dolly for lawn trimmer and combination thereof. 4,442,659, Cl. 56-12.700.
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Energy Conversion Devices, Inc.: *See*—
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Engel, Wolfhard; Trummlitz, Gunter; Schmidt, Gunther; Eberlein, Wolfgang; Hammer, Rudolf; and del Soldato, Piero, to Dr. Karl Thomae GmbH. Dibenzodiazepinones, pharmaceutical compositions thereof and method of use thereof. 4,443,452, Cl. 424-256.000.
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Erwin, Robert L., deceased (by Erwin, Josiephine Reed, Personal Representative), to Erwin, Josiephine R., Personal Representative of Estate of Robert L. Erwin. Tapered rotary plug valve. 4,442,996, Cl. 251-77.000.
Escher, Sina D.; and Dietrich, Paul, to Firmenich SA. Utilization of an aromatic aldehyde 4-methyl-2-hydroxy-benzaldehyde as flavoring ingredient. 4,443,485, Cl. 426-538.000.
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Eumurian, Gregoire, to Thomson-CSF. Optical-connection direct-light modulation information transmission system with a passband extended towards the low frequencies and continuous waves. 4,443,890, Cl. 455-613.000.
Euroceltique, S.A.: *See*—
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Everett, Wilhelm S. Surge chamber. 4,442,858, Cl. 137-207.000.
Ewing, Channing B. Pharmaceutical methods and compositions using parabenzoquinone. 4,443,479, Cl. 424-331.000.
Ex-Cell-O Corporation: *See*—
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Siegell, Jeffrey H., 4,443,231, Cl. 55-3.000.
Ezawa, Masashi; Makino, Hiroshi; and Futami, Tadao, to Kanagawa Prefectual Government; and Futami Plastic Industrial Co., Ltd. Earth terminal for electrical equipment. 4,443,054, Cl. 339-273.00R.
Ezawa, Sadaaki, to Kabushiki Kaisha Kawai Gakki Seisakusho. Effect generating system for an electronic musical instrument. 4,442,751, Cl. 84-1.250.
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Martins, Joseph G.; Donermeyer, Donald D.; and Fabel, David A., 4,443,518, Cl. 428-336.000.
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Faroudja, Yves C. Chroma noise reduction system for quadrature modulated color television picture signals. 4,443,817, Cl. 358-167.000.
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Findeisen, Allen G.; Mellenbruch, Larry L.; and Lentz, Wallace D., to United States of America, Navy. Digital multi-tapped delay line with automatic time-domain programming. 4,443,765, Cl. 328-55.000.

Finley, Joseph H.; and Liao, Hsiang P., to FMC Corporation. Process for the manufacture of mixed phosphoric acid ester compositions. 4,443,384, Cl. 260-982.000.

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Fischer, Adolf, to Bayerische Motoren Werke AG. Boost control device for internal combustion engines with exhaust gas turbocharger. 4,442,672, Cl. 60-602.000.

Fischer, Harry C. Ice-maker. 4,442,681, Cl. 62-347.000.

Fischer, Robert; and de Ahna, Heinz D., to Degussa Aktiengesellschaft. Ceramic color body. 4,443,265, Cl. 106-306.000.

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Flachbarth, Charles T.; Benscoter, Richard D.; and Sheridan, James E., to Butler Manufacturing Company. Flush floor fitting. 4,443,654, Cl. 174-48.000.

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Flex-Kleen Corporation: *See*—
Ulvestad, Edward A., 4,443,237, Cl. 55-379.000.

Floreen, Stephen, to Inco Research & Development Center, Inc. Cobalt free maraging steel. 4,443,254, Cl. 75-123.00B.

Florens, Georges E., deceased: *See*—
Jourdain, Philippe; Florens, Georges E., deceased; and Souquet, Georges A. L., representative, 4,442,966, Cl. 228-123.000.

Floyd, Johnnie E.; and Brune, Robert A., Jr., to Floyd, Johnnie E. Ball throwing machine and system having three individually controllable wheel speeds and angles. 4,442,823, Cl. 124-78.000.

FMC Corporation: *See*—
Finley, Joseph H.; and Liao, Hsiang P., 4,443,384, Cl. 260-982.000.
Guiseley, Kenneth B., 4,443,486, Cl. 426-584.000.

Fohl, Artur, to REPA Feinstanzwerk GmbH. Driving device. 4,442,674, Cl. 60-632.000.

Fontana, Richard. Racetrack guard. 4,443,002, Cl. 256-59.000.

Foo, George; Grodkiewicz, Raymond W.; Kubis, Stanley E.; and Lindsay, Gordon C., to AT&T Technologies, Inc.; and Nassau Recycle Corporation. Method of reclaiming component materials. 4,442,582, Cl. 29-403.300.

Ford Aerospace & Communications Corporation: *See*—
Smith, Terry M., 4,443,804, Cl. 343-786.000.

Ford Motor Company: *See*—
Ezis, Andre, 4,443,394, Cl. 264-65.000.
Gable, Stewart V.; and King, Francis G., 4,442,708, Cl. 73-117.000.
Modur, Bhaskar S.; Perl, Uwe W.; and Smick, Donald E., 4,443,177, Cl. 425-543.000.

Forgeng, William D.: *See*—
Brown, Harry J.; Forgeng, William D.; and Brown, Charles W., 4,443,255, Cl. 75-251.000.

Forney Engineering Company: *See*—
Slater, Billy R., 4,443,861, Cl. 364-900.000.

Fort Wayne Wire Die, Inc.: *See*—
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Forward, Cleve: *See*—
Watson, James M.; and Forward, Cleve, 4,443,643, Cl. 585-437.000.

Fory, Werner; Gass, Karl; Meyer, Willy; and Schurter, Rolf, to Ciba-Geigy Corporation. N-Phenylsulfonyl-N-triazinylureas. 4,443,243, Cl. 71-93.000.

Fory, Werner: *See*—
Meyer, Willy; and Fory, Werner, 4,443,245, Cl. 71-93.000.
Rempfler, Hermann; and Fory, Werner, 4,443,247, Cl. 71-94.000.

Forys, Edward L.; and Malueg, Richard M., to McDonnell Douglas Corporation. Two axis actuator. 4,443,743, Cl. 318-115.000.

Foster Grant Corporation: *See*—
Weis, Robert, 4,442,788, Cl. 118-405.000.

Foust, Tommy C., to Otis Engineering Corporation. Kickover tool. 4,442,893, Cl. 166-117.500.

Fowler, David E.: *See*—
Capella, Joseph A.; and Fowler, David E., 4,443,269, Cl. 134-12.000.

Fowler, John T., to Laitram Corporation, The. Remote indicator for displaying transmitted data by angular displacement. 4,443,795, Cl. 340-870.310.

Fox, Jeffrey R., to GTE Laboratories Incorporated. Driver circuit. 4,443,715, Cl. 307-270.000.

Fox, Rita T.: *See*—
Cimarusti, Christopher M.; Fox, Rita T.; Fritz, Alan W.; Koster, William H.; and Moniot, Jerome L., 4,443,374, Cl. 260-245.400.

Fox, Rodney, to Reckitt & Colman Products Limited. Foliar feed. 4,443,242, Cl. 71-11.000.

Framatome: *See*—
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Franklin Institute, The: *See*—
Kauffman, Kenneth W., 4,442,677, Cl. 60-673.000.

Franzen, Horst; and Rothmeier, Wolfgang, to Siemens Aktiengesellschaft. Fault detection in electronic vehicle controls. 4,443,784, Cl. 340-52.00F.

Fraser, Thomas H.; and Bruce, Barbara J., to Upjohn Company, The. Process for preparing bovine growth hormone. 4,443,539, Cl. 435-68.000.

Fraser, Thomas H.: *See*—
Herlihy, Walter C.; and Fraser, Thomas H., 4,443,608, Cl. 546-268.000.

Frater, Norman K.; Gill, Gregory G.; and Watrous, Robert B., to International Business Machines Corporation. Magnetic head arm assembly. 4,443,824, Cl. 360-104.000.

Freeman, W. Larry, to United States of America, Army. Method of making gold shield and antireflector for infrared detector array and product thereof. 4,443,303, Cl. 204-15.000.

Freenor, Francis J., III: *See*—
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Freyre, Frederick W., to Hazeltine Corporation. Acousto-optical apparatus for shifting a beam of light. 4,443,066, Cl. 350-358.000.

Frier, Richard A., to W. R. Meadows, Inc. Cold applied joint sealant. 4,443,578, Cl. 524-705.000.

Fritz, Alan W.: *See*—
Cimarusti, Christopher M.; Fox, Rita T.; Fritz, Alan W.; Koster, William H.; and Moniot, Jerome L., 4,443,374, Cl. 260-245.400.

Fry, Robert M., to ICI Americas Inc. Noncrystallizing aqueous solutions of metal salts of naphthalene sulfonic acid-formaldehyde condensation products. 4,443,358, Cl. 252-353.000.

Frye, Bruce J.; and Luedtke, Paul A. Photographic print display device. 4,442,617, Cl. 40-152.100.

Fuchs, John R., to Fuchs, Robert J. Dental operating unit with reversible dental assistant's unit. 4,443,194, Cl. 433-79.000.

Fuchs, Robert J.: *See*—
Fuchs, John R., 4,443,194, Cl. 433-79.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
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Fuji Photo Film Co., Ltd.: *See*—
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Yamamoto, Nobuyuki; Nishikawa, Yasuo; Andou, Yuji; Naruo, Kyoichi; and Okita, Tsutomu, 4,443,514, Cl. 428-216.000.

Fuji Xerox Co., Ltd.: *See*—
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Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; and Ishihama, Hiroshi, to Kowa Company Limited. Piperazine derivatives, of aromatic acids. 4,443,603, Cl. 544-373.000.

Fujino, Masahisa: *See*—
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Fujioka, Futoshi: *See*—
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Fujioka, Yoshisato, to Ricoh Col, Ltd. Camera lens system with long back focal distance and large aperture ratio. 4,443,070, Cl. 350-464.000.

Fujisawa Pharmaceutical Co., Ltd.: *See*—
Nishizono, Masahisa, 4,443,469, Cl. 424-275.000.
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,443,444, Cl. 424-246.000.
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; and Kato, Masayuki, 4,443,443, Cl. 424-246.000.

Fujita, Hiro: *See*—
Togashi, Seigo; Tsuzuki, Akira; and Fujita, Hiro, 4,443,062, Cl. 350-332.000.

Fujita, Noriaki: *See*—
Kamatani, Yoshio; and Fujita, Noriaki, 4,443,597, Cl. 544-67.000.

Fujita, Shigeru, to Toshiba Kikai Kabushiki Kaisha. Valve nozzle devices. 4,443,178, Cl. 425-564.000.

Fujitani, Hidetsugu; Ishigaki, Tsuneo; and Tokuda, Tetsuro, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Solenoid actuator. 4,443,775, Cl. 335-281.000.

Fujitsu Limited: *See*—
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Takemae, Yoshihiro, 4,443,720, Cl. 307-578.000.
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Fukuda, Masao, to Kabushiki Kaisha Ishida Koki Seisakusho. Method and apparatus for controlling zero adjustment of weight sensor. 4,442,911, Cl. 177-165.000.

Fukuda, Tadaji: *See*—
Kanbe, Junichiro; Shirai, Shigeru; and Fukuda, Tadaji, 4,443,529, Cl. 430-65.000.

Fukuda, Tadanori; and Matsunaga, Tadayo, to Toray Industries, Inc. Highly refractive urethane polymers for use in optical lenses and lenses prepared therefrom. 4,443,588, Cl. 526-301.000.
Fukuoka, Kenji: *See*—
Oinoue, Kenichi; Hayashi, Asao; Ida, Masatoshi; Aoki, Masahiro; Nakamura, Junichi; and Fukuoka, Kenji, 4,443,079, Cl. 354-407.000.
Fukushima, Naoto; Iwata, Kazuroh; Hidaka, Kunihiko; and Yabuta, Keiichiro, to Nissan Motor Co., Ltd. Vortex flow hydraulic shock absorber. 4,442,925, Cl. 188-282.000.
Fukushima, Yoshio: *See*—
Murano, Tamio; Yamane, Satoshi; Suzuki, Toshitatsu; and Fukushima, Yoshio, 4,443,082, Cl. 354-145.100.
Fulcher, Rodney D. Portable tower. 4,442,919, Cl. 182-63.000.
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, to Sharp Kabushiki Kaisha. Interference color compensation double layered twisted nematic display. 4,443,065, Cl. 350-335.000.
Funada, Fumiaki; Takamatsu, Toshiaki; and Wada, Tomio, to Sharp Kabushiki Kaisha. Liquid crystal display screen for use in TV. 4,443,819, Cl. 358-236.000.
Furtner, Gerhard, to U.S. Philips Corporation. Reproducing apparatus. 4,443,822, Cl. 360-67.000.
Furuichi, Shuhei: *See*—
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Fusayama, Takeo; and Yamauchi, Junichi, to Kuraray Co., Ltd. Varnish for protecting a tooth surface. 4,443,197, Cl. 433-217.000.
Fusser, Hermann; Groos, Horst; and Schmoll, Heinz, to SMS Schloemann-Siemag Aktiengesellschaft. Floor-mounted forging press having a stationary piston with a bore for supplying a pressure medium, and a moving cylinder. 4,442,694, Cl. 72-453.010.
Futami Plastic Industrial Co., Ltd.: *See*—
Ezawa, Masashi; Makino, Hiroshi; and Futami, Tadao, 4,443,054, Cl. 339-273.00R.
Futami, Tadao: *See*—
Ezawa, Masashi; Makino, Hiroshi; and Futami, Tadao, 4,443,054, Cl. 339-273.00R.
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Gable, Stewart V.; and King, Francis G., to Ford Motor Company. Automatic driver system. 4,442,708, Cl. 73-117.000.
Gaglione, Stanley, to United States of America, Army. Polarization control element for phased array antennas. 4,443,800, Cl. 343-372.000.
Gaither, Luis A. Fluid motor or pump. 4,443,163, Cl. 417-466.000.
Galin, Miles A. Fixation of intraocular lenses. 4,443,441, Cl. 424-244.000.
Galliher, Parrish M.: *See*—
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Ganguly, Ashit K.: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 4,443,373, Cl. 260-245.20R.
Garabedian, Michael E.; and Roehrs, Robert E., to Alcon Laboratories, Inc. Ophthmalic irrigating solution. 4,443,432, Cl. 424-127.000.
Gardner, William E. Conduit bender with angle indications. 4,442,695, Cl. 72-459.000.
Garrison, Mark R.: *See*—
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Gass, Karl: *See*—
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Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik: *See*—
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Gehman, John T., to Nixdorf Computer Corporation. Two-level priority circuit. 4,443,848, Cl. 364-200.000.
Geissler, Klaus H.; and Hubner, Karl-Heinz, to Licentia Patent-Verwaltungs-GmbH. DC/DC Converter. 4,443,840, Cl. 363-24.000.
Gelbein, Abraham P.; and Nislick, Arthur S., to Lummus Company, The. Production of epoxy compounds from olefinic compounds. 4,443,620, Cl. 549-521.000.
Gellert, Robert I.: *See*—
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Genbauffe, Francis S.; and Erdelsky, Joseph J., to Robertshaw Controls Company. Propellant charging head for filling a storage chamber of a propellant storage construction. 4,442,875, Cl. 141-348.000.
Gendler, Paul L.; and Twieg, Robert, to International Business Machines Corporation. Printing medium and use thereof. 4,443,302, Cl. 204-2.000.
General Electric Company: *See*—
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Castonguay, Roger N., 4,443,676, Cl. 200-304.000.
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Edelstein, William A.; and Bottomley, Paul A., 4,443,760, Cl. 324-309.000.
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Konrad, Charles E., 4,443,744, Cl. 318-269.000.
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Schmidt, Lawrence R.; Lovgren, Eric M.; and Meissner, Peter G., 4,443,592, Cl. 528-128.000.
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General Foods Corporation: *See*—
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General Motors Corporation: *See*—
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General Signal Corporation: *See*—
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Gentex Corporation: *See*—
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Cote, Paul L., 4,443,666, Cl. 179-111.00E.
Gentry, Ernest B., to Otis Engineering Corporation. Control valve. 4,442,859, Cl. 137-242.000.
Genuit, Luther L.; and Nowell, John R., to Honeywell Information Systems Inc. Frequency responsive system power sequencer. 4,443,709, Cl. 307-41.000.
Gerbaux, Andre A.: *See*—
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Gerin, Merlin: *See*—
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Gerster, John F.; and Stern, Richard M., to Riker Laboratories, Inc. Phenyl-substituted tricyclic antibacterial agents. 4,443,447, Cl. 424-248.530.
Gesellschaft fur biotechnologische forschung mbH (GBF): *See*—
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Gestetner Manufacturing Limited: *See*—
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Getty Synthetic Fuels, Inc.: *See*—
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Gewerkschaft Eisenhutte Westfalia: *See*—
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GFM Gesellschaft fur Fertigungstechnik und Maschinenbau Gesellschaft m.b.H.: *See*—
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Giacomelli, Renato, to MORWEN S.r.l. Method for making reinforced plastics material eyeglass frames. 4,443,074, Cl. 351-178.000.
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Gianotti, Giovanni, to Fiat Auto S.p.A. Supporting device for the vertically movable window panel of a motor-vehicle window. 4,442,633, Cl. 49-375.000.
Gibbons, Ralph D., to Lansing Bagnall Limited. Apparatus and method for the production of wiring looms. 4,442,872, Cl. 140-92.100.
Gibbs, Dennis S.: *See*—
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Giese, Leonard R.: *See*—
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Gildemeister AG: *See*—
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Gillette Company, The: *See*—
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Gimelli + Co. AG: *See*—
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Girardeau, Jean-Pierre: *See*—
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Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., to Schering Corporation. Process for the production of antibiotic penems. 4,443,373, Cl. 260-245.20R.

Gisinger, Jack L.: *See*—
Martin, Samuel A.; Bakker, Fredrick J.; Hungerink, Gerald W.; Gisinger, Jack L.; and Bush, James H., 4,443,025, Cl. 280-407.000.

Glaze, O. Howard: *See*—
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Glynn, Daniel R.: *See*—
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Glynn, John D.; Glynn, Daniel R.; and Andrews, Arthur R. Electrolysis fuel supplementation apparatus for combustion engines. 4,442,801, Cl. 123-3.000.

Goans, Kip B., to Baker CAC, Inc. Heat sensitive locking device. 4,442,756, Cl. 92-23.000.

Goans, Kip B., to Baker CAC, Inc. Fluid pressure actuator having bias element immersed in non-corrosive environment. 4,442,757, Cl. 92-82.000.

Gobel, Wilhelm: *See*—
Musch, Rudiger; Pampus, Gottfried; Muller, Peter; Eisele, Ulrich; Konter, Wolfgang; and Gobel, Wilhelm, 4,443,582, Cl. 525-215.000.
Musch, Rudiger; Pampus, Gottfried; Casper, Rudolf; Muller, Peter; and Gobel, Wilhelm, 4,443,583, Cl. 525-215.000.

Goby, Anne M.: *See*—
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Goby, Hubert L. J.: *See*—
Gouet, Philippe; Contrepois, Michel G.; Dubourguier, Henri-Charles; Girardeau, Jean-Pierre; Goby, Hubert L. J.; Goby, Therese M.; Goby, Anne M.; and Goby, Genevieve, 4,443,547, Cl. 435-253.000.

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Gouet, Philippe; Contrepois, Michel G.; Dubourguier, Henri-Charles; Girardeau, Jean-Pierre; Goby, Hubert L. J.; Goby, Therese M.; Goby, Anne M.; and Goby, Genevieve, 4,443,547, Cl. 435-253.000.

Godfrey, Timothy D.; and Smith, Rodger L. Light means and method of lighting. 4,443,831, Cl. 362-80.000.

Goerss, William G., to NLB Corp. Method for cleaning floor grates in place with high pressure water jets. 4,443,271, Cl. 134-34.000.

Gokita, Masami, to Tokyo Shibaura Denki Kabushiki Kaisha. Switch device for connecting AC power source to load. 4,443,712, Cl. 307-140.000.

Golden, Meigs C., Jr.: *See*—
Duffee, Henry S.; and Golden, Meigs C., Jr., 4,443,015, Cl. 277-30.000.

Goldman, Jacob. Closed-cycle heat-engine. 4,442,670, Cl. 60-517.000.

Goldman, Theodore D., to Rohm and Haas Company. Diene/acrylate based impact modifier for PVC. 4,443,585, Cl. 525-310.000.

Golev, Sergei P.: *See*—
Boev, Vladimir S.; Golev, Sergei P.; Dmitriev, Viktor I.; Pevzner, Efim M.; Yaure, Andrei G.; and Masandilov, Lev B., 4,443,748, Cl. 318-732.000.

Gomes, Rodney A.: *See*—
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Gonser, Donald I., to Dentsply Research and Development Corporation. Method for joining objects. 4,443,494, Cl. 156-64.000.

Goodyear Tire & Rubber Company, The: *See*—
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Sandstrom, Paul H., 4,443,279, Cl. 156-123.000.

Goralnik, Charles D. Dimmer switch for a fluorescent lamp. 4,443,740, Cl. 315-284.000.

Gordon, R. Robert. Evaporative cooling device and process for cooling large areas. 4,443,387, Cl. 261-30.000.

Gort, Ydo, to Honeywell B.V. Safety gas valve with latch. 4,442,853, Cl. 137-66.000.

Gosselin, Robert G.: *See*—
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 4,442,603, Cl. 30-249.000.

Goto, Hirokazu: *See*—
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Gouet, Philippe; Contrepois, Michel G.; Dubourguier, Henri-Charles; Girardeau, Jean-Pierre; Goby, Hubert L. J.; Goby, Therese M.; Goby, Anne M.; and Goby, Genevieve, to Institut National de la Recherche Agronomique. Animal vaccine against colibacillosis, preparation and use. 4,443,547, Cl. 435-253.000.

Goupil, Jean-Paul C.: *See*—
De Pommery, Bertrand J. C. H.; and Goupil, Jean-Paul C., 4,443,049, Cl. 339-75.0MP.

Grace, Alan G., to Efflo Incorporated. High frequency power switching circuit. 4,443,844, Cl. 363-132.000.

Grady, Clyde C., II. Machine for concrete molding. 4,442,995, Cl. 249-139.000.

Grafe, Robert J.: *See*—
Busch, Dennis G.; Grafe, Robert J.; and Leikam, Gary E., 4,443,863, Cl. 364-900.000.

Graham, Anne M.: *See*—
Pesa, Frederick A.; Graham, Anne M.; and Kliewer, Wayne R., 4,443,639, Cl. 568-885.000.

Graham, Douglas A.; Baillet, Douglas G.; and Sankey, Mark. Digital goniometer. 4,442,606, Cl. 33-1.00N.

Grant, Frederic F., to Datatape Incorporated. Tape advancing method and apparatus with fast tape advance mode. 4,442,963, Cl. 226-97.000.

Grant, George G., to Reliance Electric Co. Gear type shaft coupling. 4,443,205, Cl. 464-16.000.

Gravelle, Alain: *See*—
Marini, Jean; and Gravelle, Alain, 4,443,402, Cl. 376-252.000.

Graversen, Niels P. G.; and Pedersen, Svend P., to Danfoss A/S. Remote control temperature sensor with expansible material. 4,443,120, Cl. 374-201.000.

Gray, William T.: *See*—
Chance, Allan; and Gray, William T., 4,442,735, Cl. 81-3.440.

Great Lakes Carbon Corporation: *See*—
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., 4,443,314, Cl. 204-243.00R.

Greco, Claudio; and Fiorito, Gianfranco, to IAO Industrie Riunite S.p.A. Window regulator, particularly for motor vehicles. 4,442,632, Cl. 49-352.000.

Greco, Nicholas P., to Koppers Company, Inc. Refining lurgi tar acids. 4,443,636, Cl. 568-761.000.

Greene, Edward. Adaptor cartridge. 4,442,777, Cl. 102-444.000.

Gregg, Hans, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Pallet magazine. 4,442,935, Cl. 198-648.000.

Gregorovich, Charles J.: *See*—
Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., 4,442,691, Cl. 72-329.000.

Griffith, Jeffrey D.; and Ozretich, Thomas M., to Dow Chemical Co., The. Product for treating soil to suppress the nitrification of ammonium nitrogen therein. 4,443,625, Cl. 560-254.000.

Grimwood, Geoffrey L.; and Wright, John, to Thomas Broadbent & Sons Limited. Decanting type centrifuge. 4,443,213, Cl. 494-38.000.

Grinberg, Jan; Waldner, Michael; Braatz, Paul O.; and Jacobson, Alexander D., to Hughes Aircraft Company. High resolution AC silicon MOS-light-valve substrate. 4,443,064, Cl. 350-334.000.

Grinde, James E., to Yamaha Hatsudoki Kabushiki Kaisha. Snow vehicle. 4,442,913, Cl. 180-190.000.

Grindstaff, Henry E.: *See*—
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., 4,443,314, Cl. 204-243.00R.

Grisebach, Hans-Theodor: *See*—
Beckmann, Klaus; Grisebach, Hans-Theodor; and Weirich, Walter, 4,443,135, Cl. 405-302.000.

Grodkiewicz, Raymond W.: *See*—
Foo, George; Grodkiewicz, Raymond W.; Kubis, Stanley E.; and Lindsay, Gordon C., 4,442,582, Cl. 29-403.300.

Groeneweg, Willem H.: *See*—
Aschwanden, Felix; and Groeneweg, Willem H., 4,443,769, Cl. 329-50.000.

Groll, Robert C. Piston machine. 4,442,758, Cl. 92-138.000.

Gronbeck, Peter W.; Mullaney, Dennis; and Smith, Kimberly M., to Steelstran Industries, Incorporated. Collapsible ladder. 4,442,920, Cl. 182-199.000.

Groos, Horst: *See*—
Fusser, Hermann; Groos, Horst; and Schmoll, Heinz, 4,442,694, Cl. 72-453.010.

Gross, Glenn; and Moore, Douglas R., to Norlin Industries, Inc. Long duration aperiodic musical waveform generator. 4,442,745, Cl. 84-1.010.

Gross, Leo; and Skeist, S. Merrill, to Gross, Leo. High intensity discharge lamp with arc spreading means. 4,443,734, Cl. 313-26.000.

Gross, Reinhold; Willuhn, Dietrich; and Witte, Horst, to Klockner-Werke Aktiengesellschaft. Yieldable roof support for mine passages and the like. 4,443,134, Cl. 405-288.000.

Grow, Arthur L.; Gregorovich, Charles J.; and Seyfried, Donald N., to Minster Machine Company, The. Double action press having floating punch. 4,442,691, Cl. 72-329.000.

Grubb, Linda J.: *See*—
Worden, Dexter; Wilson, Frederic T.; and Grubb, Linda J., 4,443,511, Cl. 428-198.000.

Gruetzmacher, Ralph W.: *See*—
Isaacson, Bruce G.; Gruetzmacher, Ralph W.; and Schroeder, Kenneth W., 4,443,759, Cl. 324-216.000.

GTE Laboratories Incorporated: *See*—
Fox, Jeffrey R., 4,443,715, Cl. 307-270.000.

Guiseley, Kenneth B., to FMC Corporation. Modified extractive of *Eucheuma cottonii* seaweed and composition containing same. 4,443,486, Cl. 426-584.000.

Gullace, Michael. Aeration device. 4,443,335, Cl. 210-220.000.

Gunther, Bernd-Rainer, to A. Nattermann & Cie GmbH. Process for the separation of acylated phospholipids from phosphatidylcholine products containing the same. 4,443,378, Cl. 260-403.000.

Gunther, Conrad J., to Dzus Fastener Co., Inc. Slotted fastener. 4,442,561, Cl. 10-1.00R.

Gunther, Siegfried; and Winterholler, Cohann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Air lock, particularly to permit drying of a printed web in a controlled atmosphere. 4,442,611, Cl. 34-41.000.

Gutbrod, Robert: *See*—
Dietz, Erwin; Maikowski, Michael; and Gutbrod, Robert, 4,443,263, Cl. 106-287.240.
Gutek, Beth I., to Dow Corning Corporation. Liquid organosiloxane resin compositions. 4,443,502, Cl. 427-387.000.
Guth, Jacob J.; and Verdicchio, Robert J., to Johnson & Johnson Baby Products Company. Detergent compounds and compositions. 4,443,362, Cl. 252-545.000.
Guthrie, Robert W.; Kierstead, Richard W.; Mennona, Francis A.; and Sullivan, Ann C., to Hoffmann-La Roche Inc. Chlorocitric acids. 4,443,619, Cl. 549-518.000.
Gutierrez, Antonio M., to Empresa Cubana Exportadora E Importadora de Productos Medicos. Apparatus for the confection of maxillar models through cephalometic analysis. 4,443,191, Cl. 433-56.000.
Haberland, Siegfried, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,442,816, Cl. 123-457.000.
Haerer, James P. Hydraulically operated hand tool for forcing open doors. 4,443,001, Cl. 254-93.00R.
Haga, Tomoyuki: *See*—
Sakuragi, Shiro; Imagawa, Kyoshiro; Kotani, Haruo; Saito, Mitsunori; and Haga, Tomoyuki, 4,443,684, Cl. 219-121.0LH.
Hagiwara, Takaaki; and Yatsuda, Yuji, to Hitachi, Ltd. Nonvolatile semiconductor memory with stabilized level shift circuit. 4,443,718, Cl. 307-530.000.
Hague, Yusuf A., to American Microsystems, Inc. High resolution fast diode clamped comparator. 4,443,717, Cl. 307-362.000.
Hahn, Granville J.; and Rutledge, Raleigh N., to Cosden Technology, Inc. Multiple-layered sheeting apparatus and process therefor. 4,443,397, Cl. 264-171.000.
Hahn, Norbert; Hipp, Steven J.; and Swessel, Michael A., to Rite-Hite Corporation. Releasable locking device. 4,443,150, Cl. 414-401.000.
Hahs, Charles A.; and Burbage, Charles H., to United States of America, Energy. Valve for gas centrifuges. 4,442,861, Cl. 137-595.000.
Haines, William E.: *See*—
Hodkinson, Harold; and Haines, William E., 4,442,924, Cl. 188-79.5GT.
Hairston, Hannon S.; and Hanrath, M. E., to Mobile Pulley & Machine Works (A division of Lehigh Valley Industries, Inc.). Ball joint. 4,443,030, Cl. 285-263.000.
Haken, Roger A., to Texas Instruments Incorporated. High-voltage CMOS process. 4,442,591, Cl. 29-571.000.
Hall, Bertrand J.: *See*—
Karmiol, Mark H.; Hickernell, Gary L.; and Hall, Bertrand J., 4,443,601, Cl. 544-274.000.
Hall, Douglas D., to Armco Inc. Remotely operated tool for performing functions under water. 4,443,130, Cl. 405-190.000.
Hall, Norman M., Jr., to Calnor of El Paso. Gas detection system. 4,443,793, Cl. 340-634.000.
Halland, Bruce: *See*—
Isaacson, Douglas T., 4,443,149, Cl. 414-326.000.
Halle, Reidar: *See*—
Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, 4,443,376, Cl. 260-453.0RZ.
Hallmark Cards, Inc.: *See*—
Cuminale, Raymond J.; Otto, Stanley W.; Knipp, Jerry L.; Seibolt, Bernard P.; and Yarkoni, Fred E., 4,442,942, Cl. 211-163.000.
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Inoue, Ryuzaburo, to Nissan Motor Co., Ltd. Internal combustion engine ignition method. 4,442,821, Cl. 123-639.000.
Hamashima, Yoshio: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,443,598, Cl. 544-90.000.
Hamilton, Luke C. Shelf bracket. 4,442,638, Cl. 52-36.000.
Hamilton, Stephen P.; and Hunter, Arthur C., to Texas Instruments Incorporated. Memory system having a common interface. 4,443,845, Cl. 364-200.000.
Hammer, Rudolf: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Schmidt, Gunther; Eberlein, Wolfgang; Hammer, Rudolf; and del Soldato, Piero, 4,443,452, Cl. 424-256.000.
Hammerling, Heinz; and Schairer, Werner, to Licentia Patent-Verwaltungs-GmbH. Data transmission system employing wire and wireless transmission paths. 4,443,786, Cl. 340-310.00R.
Hammond, Errol C., to Kerilea Cloche Limited. Cloches. 4,442,626, Cl. 47-29.000.
Hammond, Wayne H.; and Jones, George V., to Olin Corporation. Surfactant washing of polychloroisocyanuric acids. 4,443,600, Cl. 544-190.000.
Hanacek, William A.: *See*—
Armstrong, Errol C.; Hanacek, William A.; and Spinetti, Thomas A., 4,443,151, Cl. 414-404.000.
Handlykken, Mathias B., to United States of America, National Aeronautics and Space Administration. Shaft transducer having DC output proportional to angular velocity. 4,443,724, Cl. 310-171.000.
Hannah, Bruce H., to Knoll International, Inc. Desk assembly. 4,443,046, Cl. 312-183.000.
Hanrath, M. E.: *See*—
Hairston, Hannon S.; and Hanrath, M. E., 4,443,030, Cl. 285-263.000.
Hapad, Inc.: *See*—
Hauser, Theodor E., 4,442,612, Cl. 36-43.000.
Harada, Nobuo: *See*—
Yano, Mitsuo; Yoshizawa, Junji; Ishikawa, Kiyofumi; Harada, Nobuo; and Matsumoto, Ikuo, 4,443,459, Cl. 424-266.000.
Harada, Toshimitsu; and Watanabe, Koji, to Konishiroku Photo Industry Co., Ltd. Film winding device. 4,443,084, Cl. 354-173.110.
Haraguchi, Keisuke: *See*—
Tomori, Yasumasa; Shimoda, Mituhiko; and Haraguchi, Keisuke, 4,443,085, Cl. 354-402.000.
Harrar, Jackson E.: *See*—
Coon, Clifford L.; Harrar, Jackson E.; Pearson, Richard K.; and McGuire, Raymond R., 4,443,308, Cl. 204-103.000.
Harris, Craig W., to Burroughs Corporation. Interface circuit for subsystem controller. 4,443,850, Cl. 364-200.000.
Harrison, Anthony W., to Lucas Industries Limited. Gas suspension systems for vehicles. 4,443,026, Cl. 280-714.000.
Harshaw/Filtrol Partnership: *See*—
Chiang, Robert L.; and Scherzer, Julius, 4,443,553, Cl. 502-68.000.
Taylor, Dennis R.; and Demidowicz, Zenon, 4,443,379, Cl. 260-427.000.
Hartman, George D., to Merck & Co., Inc. Aminocrot onylpyridine N-oxides useful as adjuncts to radiation therapy. 4,443,457, Cl. 424-263.000.
Hartman, George D., to Merck & Co., Inc. Aminocrotonyl 3,5-dinitropyridine useful as adjuncts to radiation therapy. 4,443,458, Cl. 424-263.000.
Hartmann, Bernd. Cable bearer system. 4,442,989, Cl. 248-49.000.
Hartz, James F., to General Motors Corporation. Transmission center support mounting. 4,442,733, Cl. 74-606.00R.
Harvard, Jean F., to Brissonneau et Lotz Marine. Flexible couplings for mechanical jacking devices used in the installation of marine platforms. 4,443,000, Cl. 254-89.00R.
Hasegawa, Kaiichi, to Billcon Corporation of America. Document and currency counter. 4,443,006, Cl. 271-10.000.
Hasegawa, Yasumasa: *See*—
Koike, Masaru; Hasegawa, Yasumasa; Shimosaka, Satoru; Aoyama, Nagara; and Yoshizumi, Toshihiko, 4,442,876, Cl. 144-2.00R.
Hasenauer, Dieter, to Brown, Boveri & CIE AG. High-temperature battery. 4,443,525, Cl. 429-102.000.
Hasenauer, Dieter: *See*—
Meinhold, Henner; and Hasenauer, Dieter, 4,443,524, Cl. 429-99.000.
Hasennauer, Dieter, to Brown, Boveri & Cie AG. High-temperature battery. 4,443,523, Cl. 429-99.000.
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, to Sharp Kabushiki Kaisha. Electronic translator for modifying and speaking out sentence. 4,443,856, Cl. 364-513.500.
Hata, Fumio: *See*—
Miyakawa, Hideaki; Takahashi, Yasuki; and Hata, Fumio, 4,443,090, Cl. 354-289.120.
Hata, Yukio: *See*—
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Hattori, Eizou: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,443,603, Cl. 544-373.000.
Hattori, Kyo: *See*—
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Hattori, Yutaka: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi. 4,443,781, Cl. 338-34.000.
Hauck Manufacturing Company: *See*—
Wojcieson, Raymond J.; and Nowak, Leonard G., 4,443,182, Cl. 431-183.000.
Hauenstein, Clifford A.: *See*—
Wong, George S.; Catterfeld, Fritz C.; and Hauenstein, Clifford A., 4,443,152, Cl. 415-143.000.
Hauer, Jerome M.; and Thurer, Robert L. Blood collection and transfer apparatus. 4,443,220, Cl. 604-408.000.
Hauschild, John P.; and Principe, Joseph R., to Colgate-Palmolive Company. Packaged speckled dentifrice. 4,443,564, Cl. 523-105.000.
Hauser, Georg; and Hoggenstaller, Rolf, to J. Strobel & Sohne GmbH & Co. Ironing table with a movable blower unit. 4,442,616, Cl. 38-14.000.
Hauser, Theodor E., to Hapad, Inc. Orthopedic pads. 4,442,612, Cl. 36-43.000.
Haussmann, Wolfgang: *See*—
Luder, Rainer; and Haussmann, Wolfgang, 4,443,774, Cl. 333-165.000.
Havot, Henri A. P. Plate-type antenna with double circular loops. 4,443,805, Cl. 343-803.000.
Hawie Mfg. Co., The: *See*—
Hawie, Robert L., 4,442,623, Cl. 43-54.100.
Hawie, Robert L., to Hawie Mfg. Co., The. Container for umbrella rig. 4,442,623, Cl. 43-54.100.
Hawkins, Peter A. T. Mobile crusher vehicle. 4,442,766, Cl. 100-35.000.
Haworth, Floy, to Haworth, Juanita J. Combination cycle, dual process engine. 4,442,673, Cl. 60-618.000.
Haworth, Juanita J.: *See*—
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Hayakawa Rubber Company Limited: *See*—
Ishido, Yoshinobu; and Tanaka, Hideo, 4,443,019, Cl. 277-227.000.
Hayakawa, Yoichi, to Aisin Warner Kabushiki Kaisha. Lubricating system for four-wheel drive torque transfer mechanism. 4,442,729, Cl. 74-467.000.
Hayashi, Asao: *See*—
Oinoue, Kenichi; Hayashi, Asao; Ida, Masatoshi; Aoki, Masahiro; Nakamura, Junichi; and Fukuoka, Kenji, 4,443,079, Cl. 354-407.000.

Hayashi, Hitoaki, to Asahi Dempa Co., Ltd. Temperature-compensated crystal resonator unit. 4,443,732, Cl. 310-343.000.

Hayashi, Toshihiro: *See—*
Mutoh, Masayuki; Ishidoh, Takanobu; and Hayashi, Toshihiro, 4,443,820, Cl. 358-296.000.

Hayashida, Shinsaku; Ogata, Seiya; and Yoshino, Sadazo, to Idemitsu Kosan Company Limited. Process for the production of butanol and novel microorganism composition used therein. 4,443,542, Cl. 435-160.000.

Hayes, Jerry R., to L. R. Nelson Corporation, Inc. Quick coupling assembly. 4,443,028, Cl. 285-38.000.

Hayes, Susan E.: *See—*
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Haynes, Richard, to Western Electric Company, Inc. Emulsion electrowinning. 4,443,305, Cl. 204-59.00M.

Hazel, Robert L.; and LaBudde, Edward V., to Burroughs Corporation. Optical memory system providing track following. 4,443,870, Cl. 369-44.000.

Hazeltine Corporation: *See—*
Freyre, Frederick W., 4,443,066, Cl. 350-358.000.

Health Physics Systems, Inc.: *See—*
Capella, Joseph A.; and Fowler, David E., 4,443,269, Cl. 134-12.000.

Hearn, Daniel P., to Atlantic Richfield Company. Hand operated level detector. 4,443,702, Cl. 250-357.100.

Hefner, Robert E., Jr., to Dow Chemical Company, The. DCPD Modified polyester physical property improvement. 4,443,580, Cl. 525-44.000.

Heikens, Harm H.; and Crommentuyn, Gerardus J., to Oce-Nederland B.V. Colored magnetically attractable toner powder, its preparation, and developing images with such powder. 4,443,527, Cl. 430-39.000.

Heikkila, Risto M.: *See—*
Tuovinen, Frans H.; Norrman, Bengt J. F.; and Heikkila, Risto M., 4,443,878, Cl. 373-9.000.

Heinzelmann, Hans: *See—*
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Hellberg, Arne, to Hellberg Protection AB. Adapter for a protective helmet. 4,442,551, Cl. 2-10.000.

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Heller, Gerhard; Adelmann, Manfred; Wendorf, Wilfried; and Konigs, Wilhelm, to Alkem GmbH. Pressing device for producing compacts from source material in powder form, in particular pulverized nuclear reactor fuel. 4,443,174, Cl. 425-147.000.

Helman, Edward R.; Helman, Herbert A.; Holtschneider, Henry B.; Buford, Sidney P.; Fava, Donald C.; and Christopher, Jeffrey N., to Supreme Associates. Solar heat collector. 4,442,827, Cl. 126-430.000.

Helman, Herbert A.: *See—*
Helman, Edward R.; Helman, Herbert A.; Holtschneider, Henry B.; Buford, Sidney P.; Fava, Donald C.; and Christopher, Jeffrey N., 4,442,827, Cl. 126-430.000.

Helms, Charles R., to Container Corporation of America. Peelable, sealable closure arrangement. 4,442,971, Cl. 229-43.000.

Hempell, L. Bruce, to Nabu Manufacturing Corporation. Wired program distribution system tamper detector. 4,443,815, Cl. 358-114.000.

Hennig, William G.: *See—*
Whittingham, Thomas D.; Hennig, William G.; and Brahler, Thomas A., 4,442,741, Cl. 83-80.000.

Henning, Harold I. G.: *See—*
Strow, Donald A.; and Henning, Harold I. G., 4,443,126, Cl. 403-24.000.

Hennings, Willi: *See—*
Hund, Franz; Hennings, Willi; Brunn, Horst; Kresse, Peter; and Rambold, Wolfgang, 4,443,264, Cl. 106-292.000.

Hennon, Gary J., to Midwest Research Institute. Situ method of coating buried conductive structures. 4,443,312, Cl. 204-181.00R.

Hepp, Gunter: *See—*
Bonnekamp, Horst; Sauer, Baldur; Wolkewitz, Heinrich; Hepp, Gunter; and Kraemer, Walter, 4,443,184, Cl. 432-13.000.

Hercules Incorporated: *See—*
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Herlihy, Walter C.; and Fraser, Thomas H., to Repligen Corporation. (+)(−)-Tropicamide O-β-B-glucuronic acid, its diastereomers, and salts thereof. 4,443,608, Cl. 546-268.000.

Herman, Fred L.; and Johns, Kenneth H. Pipe testing apparatus. 4,442,703, Cl. 73-49.500.

Herrington, F. John, to Mobil Oil Corporation. Method and apparatus for the formation of profiled thermoplastic film. 4,443,400, Cl. 264-519.000.

Hersen, Rene M. J.: *See—*
Legrand, Paul J.; and Hersen, Rene M. J., 4,442,987, Cl. 244-110.00B.

Herve Guy: *See—*
de Sivry, Bruno; Migliarese-Caputi, Jean-Louis; Herve Guy; and Colas, Claude, 4,443,129, Cl. 405-170.000.

Hessburg, Philip C. Intraocular lens. 4,442,553, Cl. 3-13.000.

Hesse, Werner: *See—*
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Hickernell, Gary L.: *See—*
Karmiol, Mark H.; Hickernell, Gary L.; and Hall, Bertrand J., 4,443,601, Cl. 544-274.000.

Hicter, Jean-Marie; Le Scoul, Thierry; and Mairet, Serge, to Societe de Vente de l'Aluminium Pechiney. Device for the treatment of a stream of aluminum or magnesium-based liquid metal or alloy during its passage. 4,443,004, Cl. 266-226.000.

Hidaka, Kunihiko: *See—*
Fukushima, Naoto; Iwata, Kazuroh; Hidaka, Kunihiko; and Yabuta, Keiichiro, 4,442,925, Cl. 188-282.000.

Hierholzer, Frank J., Jr.; and Shelton, Gerald L., to Emerson Electric Co. Silicon carbide resistance element. 4,443,361, Cl. 252-516.000.

Higgins, William A.; and Perz, John S., to Lubrizol Corporation, The. One-component moisture curable urethane coating system. 4,443,577, Cl. 524-590.000.

Hikosaka, Mititika: *See—*
Tamura, Shinichi; Seta, Toshio; Tanaka, Tsuneo; and Hikosaka, Mititika, 4,443,528, Cl. 430-56.000.

Hilbert, Thomas K.: *See—*
Swapceinski, John P.; Rose, Leon A.; Probst, Stewart D.; McKeown, Donald G.; and Hilbert, Thomas K., 4,442,790, Cl. 118-657.000.

Hildebrand, Robert: *See—*
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Hill, Ronald A.; Tillmanns, Ralf; and Sieberling, Bernd, to W. L. Gore & Associates, Inc. Ribbon cable with a two-layer insulation. 4,443,657, Cl. 174-110.0FC.

Hiller, Wolfgang; and Kramer, Hans, to MERO-Werke Dr.-Ing. Max Mengeringhausen GmbH & Co. Construction panel for double floors in air conditioned rooms. 4,442,645, Cl. 52-221.000.

Hillman, Melville E. D., to Battelle Development Corporation. Thermochemical conversion of biomass to ethanol. 4,443,637, Cl. 568-876.000.

Hills, Derek W.; and White, George R., to Smith Kline & French Laboratories Limited. Tetrahydroimidazo(3,4-c)-1,3-diazocine intermediates for production of guanidines. 4,443,375, Cl. 260-245.600.

Hinds, Edward T., to Brunswick Corporation. Flow sensor. 4,443,671, Cl. 200-81.00R.

Hipp, Steven J.: *See—*
Hahn, Norbert; Hipp, Steven J.; and Swessel, Michael A., 4,443,150, Cl. 414-401.000.

Hirano, Hirofumi: *See—*
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Hirano, Masachika: *See—*
Kasamatsu, Kiyoshi; Hirano, Masachika; and Okuno, Takeshi, 4,443,438, Cl. 424-200.000.

Hirano, Seiichi, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Printer. 4,443,125, Cl. 400-328.000.

Hirao, Toshiki; and Okamoto, Kouichi, to Mitsubishi Denki Kabushiki Kaisha. Rotor of a superconductive rotary electric machine. 4,443,722, Cl. 310-45.000.

Hirata, Goichi: *See—*
Samejima, Masayoshi; and Hirata, Goichi, 4,443,497, Cl. 427-213.360.

Hirata, Mitsuteru: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,443,603, Cl. 544-373.000.

Hirokane, Tadashi: *See—*
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 4,442,829, Cl. 126-452.000.

Hirose, Michio: *See—*
Otani, Mitsunobu; Senda, Teruo; and Hirose, Michio, 4,443,337, Cl. 210-602.000.

Hirsch, Gustav M.; and Bar-Nof, Moshe, to Noga Engineering Ltd. Tool handle. 4,442,601, Cl. 30-169.000.

Hirsch, Martin: *See—*
Meyer, Kurt; Reh, Lothar; Hirsch, Martin; Schnabel, Wolfram; and Serbent, Harry, 4,443,250, Cl. 75-26.000.

Hirschburger, Kurt. Device for intermediate storage of thread. 4,442,573, Cl. 28-271.000.

Hirschmanner, Franz; and Rom, Ernst, to Voest-Alpine Aktiengesellschaft. Coiler-furnace combination. 4,442,690, Cl. 72-128.000.

Hirshburg, Robert: *See—*
Burket, Richard S.; Conaghan, Brian F.; and Hirshburg, Robert, 4,443,504, Cl. 427-445.000.

Hisagen, Yoshiaki: *See—*
Nakajima, Kaoru; Kobayashi, Kunio; and Hisagen, Yoshiaki, 4,443,490, Cl. 427-44.000.

Hisamitsu Pharmaceutical Co., INc.: *See—*
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Nakashima, Yoichi; Tsuji, Masayoshi; Aoki, Tetsuo; and Ide, Hiroyuki, 4,443,626, Cl. 562-434.000.

Hitachi Koki Co., Ltd.: *See—*
Ainoya, Masayuki; Kozawa, Hiroomi; and Chikuzenya, Takao, 4,443,091, Cl. 355-3.0TR.
Moriguchi, Seki; Koizumi, Katsuo; and Nagayama, Sueji, 4,442,878, Cl. 145-4.000.

Hitachi, Ltd.: *See—*
Hagiwara, Takaaki; and Yatsuda, Yuji, 4,443,718, Cl. 307-530.000.
Ikegawa, Masato; Tojo, Kenji; and Shiibayashi, Masao, 4,443,166, Cl. 418-55.000.
Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi. Takashi; and Koda, Toyomasa, 4,443,812, Cl. 357-53.000.
Kashiwaya, Mineo; Nakagawa, Tohru; Yamada, Kinsaku; Kamifuji, Hiroshi; Oyama, Yoshishige; Kuroiwa, Hiroshi; and Tsuruta, Hisato, 4,442,818, Cl. 123-494.000.
Ohba, Shinya; Nakai, Masaaki; Ozaki, Toshifumi; and Takahashi, Kenji, 4,443,818, Cl. 358-213.000.

Shimazu, Nobuo; Okubo, Tsuneo; Saitou, Norio; and Ozasa, Susumu, 4,443,703, Cl. 250-491.100.
Suenaga, Masahide; Tsukada, Yukihisa; and Yamamoto, Hiroshi, 4,443,294, Cl. 156-656.000.
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.
Tanaka, Katsuyuki; Ohashi, Shin-ichi; Saito, Masakatsu; and Sampei, Tohru, 4,443,741, Cl. 315-307.000.
Yatsuo, Tsutomu; and Nagano, Takahiro, 4,443,810, Cl. 357-38.000.

Hittel, Gerhard: *See—*
Bergmann, Gerhard; and Hittel, Gerhard, 4,442,684, Cl. 66-84.00A.

Ho, Kuang-Ta, to Colt Industries Operating Corp. Superimposed high striking voltage power supply circuit for electrical discharge machining. 4,443,682, Cl. 219-69.00C.

Hodge, Edward B.; and Wolfrom, Glen W., to International Minerals & Chemical Corp. Method of promoting growth and enhancing feed efficiency in meat producing animals. 4,443,470, Cl. 424-279.000.

Hodgkin, Alan F., to Babcock Power Limited. Vapor generating and vapor superheating installations. 4,442,678, Cl. 60-676.000.

Hodkinson, Harold; and Haines, William E., to Automotive Products Limited. Internal shoe drum brakes. 4,442,924, Cl. 188-79.5GT.

Hoechst Aktiengesellschaft: *See—*
Dietz, Erwin; Maikowski, Michael; and Gutbrod, Robert, 4,443,263, Cl. 106-287.240.
Klinger, Wolfgang; and Milewski, Eckhard, 4,443,363, Cl. 252-547.000.
Klinger, Wolfgang; and Milewski, Eckhard, 4,443,364, Cl. 252-547.000.
Opitz, Konrad, 4,443,224, Cl. 8-527.000.
Papenfuhs, Theodor; and Berthold, Rudiger, 4,443,630, Cl. 564-406.000.
Petry, Rudolf, 4,442,568, Cl. 17-33.000.
Rohser, Helmut, 4,443,226, Cl. 8-532.000.

Hoesch Werke AG: *See—*
Ketschker, Walter; Marquart, Reinhard; and Stenert, Alois, 4,443,045, Cl. 308-223.000.

Hofer, Peter, to Purdue Frederick Company, The. Production of 3-pyrrolin-2-ones. 4,443,616, Cl. 548-543.000.

Hoffman, Stanley J., Jr.; and Waffner, William D., to Moog Inc. Fail-safe single-stage servovalve. 4,442,855, Cl. 137-83.000.

Hoffmann-La Roche Inc.: *See—*
Guthrie, Robert W.; Kierstead, Richard W.; Mennona, Francis A.; and Sullivan, Ann C., 4,443,619, Cl. 549-518.000.

Hofmann, Gloris R., to Brunswick Corporation. Spark plug wiring assembly. 4,443,047, Cl. 339-26.000.

Hofmann, Horst; and Lochner, Karl-Heinz, to Kraftwerk Union Aktiengesellschaft. Control and monitoring device for influencing safety-relevant system parts of a power plant. 4,443,710, Cl. 307-80.000.

Hogan, Robert D., Jr.; Sanghvi, Narendra T.; and Morris, Richard F., to Indianapolis Center for Advanced Research, Inc. Digital video image splitter. 4,443,816, Cl. 358-160.000.

Hoggenstaller, Rolf: *See—*
Hauser, Georg; and Hoggenstaller, Rolf, 4,442,616, Cl. 38-14.000.

Hogsett, Robert F.: *See—*
Queneau, Paul B.; Hogsett, Robert F.; Beckstead, Leo W.; and Huggins, Dale K., 4,443,415, Cl. 423-68.000.

Hokama, Takeo, to Velsicol Chemical Corporation. Phenoxyphenoxypropionic acids and derivatives, and their use as herbicides. 4,443,248, Cl. 71-98.000.

Hokko Chemical Industry Co., Ltd.: *See—*
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Moriyama, Satoru; Chono, Tadashi; and Uchiyama, Tsugio, 4,443,439, Cl. 424-211.000.

Holden, M. James, to Mobil Oil Corporation. Reinforced packaging tray. 4,442,969, Cl. 229-2.50R.

Holland, Arthur: *See—*
Izu, Masatsugu; Nath, Prem; and Holland, Arthur, 4,443,652, Cl. 136-251.000.

Holland, Floyd H.: *See—*
Draper, Homer L.; Holland, Floyd H.; and Brost, Robert L., 4,443,570, Cl. 524-62.000.

Holland Hitch Company: *See—*
Martin, Samuel A.; Bakker, Fredrick J.; Hungerink, Gerald W.; Gisinger, Jack L.; and Bush, James H., 4,443,025, Cl. 280-407.000.

Hollifield, Charles M.; and Smith, Teddy D., to Occidental Chemical Corporation. Process for removing particulate impurities from aqueous phosphoric acid. 4,443,421, Cl. 423-321.00R.

Holm, Kurt A., to Bycosin AB. Cleaning of objects with solvent. 4,442,851, Cl. 134-106.000.

Holmberg, Paul M., to Ardal og Sunndal Verk a.s. Anode butt remover. 4,442,593, Cl. 29-825.000.

Holstein & Kappert GmbH: *See—*
Rademacher, Friedrich, 4,442,653, Cl. 53-266.00R.

Holtschneider, Henry B.: *See—*
Helman, Edward R.; Helman, Herbert A.; Holtschneider, Henry B.; Buford, Sidney P.; Fava, Donald C.; and Christopher, Jeffrey N., 4,442,827, Cl. 126-430.000.

Holycross, Mark E.: *See—*
Saccocio, Edward J.; and Holycross, Mark E., 4,443,409, Cl. 422-186.040.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Matsuura, Masaaki; and Nokano, Yoshikatsu, 4,442,806, Cl. 123-198.00F.
Shimamura, Haruo; and Yamaoka, Yasuhiro, 4,442,811, Cl. 123-376.000.
Wakatsuki, Goroei; and Yamamoto, Sadashi, 4,442,923, Cl. 188-79.50K.

Honda, Makoto: *See—*
Aoki, Kunitoshi; Honda, Makoto; Dozono, Tetsuro; and Katsumata, Tsutomu, 4,443,556, Cl. 502-212.000.

Honeywell B.V.: *See—*
Gort, Ydo, 4,442,853, Cl. 137-66.000.

Honeywell Inc.: *See—*
LeFrois, Richard T., 4,443,180, Cl. 431-4.000.
Planer, Norman G.; and Zansky, Zoltan, 4,443,719, Cl. 307-570.000.

Honeywell Information Systems Inc.: *See—*
Genuit, Luther L.; and Nowell, John R., 4,443,709, Cl. 307-41.000.
Lakhani, Kishor M.; and Ligon, Jerry L., 4,443,292, Cl. 156-634.000.

Honna, Kosaku: *See—*
Iida, Hiroshi; Iino, Akira; and Honna, Kosaku, 4,443,552, Cl. 502-66.000.

Hoogovens Groep B.V.: *See—*
Kreijger, Pieter J.; and Buhrmann, Gerardus P., 4,443,252, Cl. 75-48.000.

Hooker, Donald E.; and Tojza, Roman A., to Bally Manufacturing Corporation. Gaming apparatus having manually controllable-operating speed. 4,443,209, Cl. 474-94.000.

Hoover, John W.; Chapman, Raymond C.; Dammassa, Dominick F.; and Rutkowski, Richard G., to Dictaphone Corporation. Tape cassette. 4,443,827, Cl. 360-132.000.

Hori, Takahiro: *See—*
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,443,496, Cl. 427-140.000.

Horiba, Ltd.: *See—*
Sakuragi, Shiro; Imagawa, Kyoshiro; Kotani, Haruo; Saito, Mitsunori; and Haga, Tomoyuki, 4,443,684, Cl. 219-121.0LH.

Horikoshi, Koki; Shibanai, Ichiro; and Kato, Takashi, to Rikagaku Kenkyusho; and Shibanai, Ichiro. Process for the oil extraction from oil sand by using cyclodextrin and hydrocarbon solvents. 4,443,323, Cl. 208-11.0LE.

Horiuchi, Takefumi: *See—*
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.

Horiuchi, Tatsuo; and Kiyota, Kazushige, to Ushio Denki Kabushiki Kaisha. Auxiliary head lamp device for car equipped with cover. 4,443,836, Cl. 362-375.000.

Horner, Jack R.: *See—*
Lindsey, Stanley D.; Ioannides, Socrates A.; Horner, Jack R.; Denton, William S.; Shell, Donald P.; and Bebb, Hubert, 4,442,639, Cl. 52-73.000.

Hornle, Reinhold: *See—*
Wolff, Joachim; Wolf, Karlheinz; Koll, Jochen; Hornle, Reinhold; Molls, Hans-Heinz; and Paulat, Volker, 4,443,225, Cl. 8-549.000.

Horton, Gary L.: *See—*
Ziegenhain, William C.; and Horton, Gary L., 4,443,634, Cl. 568-621.000.

Hoshino, Minoru; Shinohara, Tosio; Tanabe, Hiroyuki; Taki, Tooru; and Nakayama, Shunsuke, to Dai Nippon Toryo Co., Ltd. Anti-corrosive coating composition and process for formation of anti-corrosive coatings. 4,443,503, Cl. 427-421.000.

Hosoda, Yuuichi: *See—*
Ikeda, Hisashi; and Hosoda, Yuuichi, 4,443,286, Cl. 156-245.000.

Hosoe, Kazuya; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; Kawabata, Takashi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Focus adjusting device. 4,443,086, Cl. 354-409.000.

Hotchkiss, Alan B.: *See—*
Adamoski, William; and Hotchkiss, Alan B., 4,443,007, Cl. 271-269.000.

Howe, Michael W.: *See—*
Sopp, Samuel W.; Lee, Leonard S.; and Howe, Michael W., 4,443,425, Cl. 423-635.000.

HRI, Inc.: *See—*
Nongbri, Govanon, 4,443,330, Cl. 208-112.000.

Huai-Chieh, Hsu. Fuse switch with plural positionable fuse elements. 4,443,780, Cl. 337-257.000.

Huang, Fu-chih, to USV Pharmaceutical Corporation. Bicyclothiazoles. 4,443,610, Cl. 548-150.000.

Hubele, Adolf: *See—*
Kunz, Walter; Eckhart, Wolfgang; and Hubele, Adolf, 4,443,618, Cl. 549-320.000.

Huber, Bernhard; Tamm, Rolf; and Tomoff, Toma, to Bodenseewerk Perkin-Elmer & Co., GmbH. Device useful for flameless atomic absorption spectroscopy. 4,443,105, Cl. 356-312.000.

Hubner, Heinz-Joachim: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,443,587, Cl. 526-146.000.

Hubner, Karl-Heinz: *See—*
Geissler, Klaus H.; and Hubner, Karl-Heinz, 4,443,840, Cl. 363-24.000.

Huggins, Dale K.: *See—*
Queneau, Paul B.; Hogsett, Robert F.; Beckstead, Leo W.; and Huggins, Dale K., 4,443,415, Cl. 423-68.000.

Hughes Aircraft Company: *See—*
Grinberg, Jan; Waldner, Michael; Braatz, Paul O.; and Jacobson, Alexander D., 4,443,064, Cl. 350-334.000.

Hulin, Jean-Pierre; DuBois, Gilles; and Paumier, Marcel, to Lignes Telegraphiques et Telephoniques. Tool-supporting device for ma-

chining a cylindrical rod and a machining head fitted with said device. 4,442,575, Cl. 29-33.500.

Hulin, Jean-Pierre; Fierfort, Claude; and Coudol, Roger, to Schlumberger Technology Corporation. Device for measuring the flow of fluid in a well. 4,442,711, Cl. 73-155.000.

Humphrey, Wayne R., to Associated Equipment Corporation. Portable battery booster assembly. 4,443,751, Cl. 320-2.000.

Hund, Franz; Hennings, Willi; Brunn, Horst; Kresse, Peter; and Rambold, Wolfgang, to Bayer Aktiengesellschaft. Halogen-free zinc ferrite yellow pigments containing alumina and phosphorus oxide and production. 4,443,264, Cl. 106-292.000.

Hungerink, Gerald W.: *See*—
Martin, Samuel A.; Bakker, Fredrick J.; Hungerink, Gerald W.; Gisinger, Jack L.; and Bush, James H., 4,443,025, Cl. 280-407.000.

Hunt, Richard M., to Bell Telephone Laboratories, Incorporated. Electromagnetic transducer. 4,443,667, Cl. 179-115.00R.

Hunter, Arthur C.: *See*—
Hamilton, Stephen P.; and Hunter, Arthur C., 4,443,845, Cl. 364-200.000.

Huntington Alloys Inc.: *See*—
Weber, John H.; and Gilman, Paul S., 4,443,249, Cl. 75-0.50R.

Huybrechts, Jozef T., to Du Pont de Nemours, E. I., and Company. Aluminum flake dispersions. 4,443,256, Cl. 106-1.050.

IAO Industrie Riunite S.p.A.: *See*—
Greco, Claudio; and Fiorito, Gianfranco, 4,442,632, Cl. 49-352.000.

ICI Americas Inc.: *See*—
Fry, Robert M., 4,443,358, Cl. 252-353.000.

Ida, Masatoshi: *See*—
Oinoue, Kenichi; Hayashi, Asao; Ida, Masatoshi; Aoki, Masahiro; Nakamura, Junichi; and Fukuoka, Kenji, 4,443,079, Cl. 354-407.000.

Ide, Hiroyuki: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Nakashima, Yoichi; Tsuji, Masayoshi; Aoki, Tetsuo; and Ide, Hiroyuki, 4,443,626, Cl. 562-434.000.

Idea Giken Ltd.: *See*—
Kawabe, Shinichi, 4,442,849, Cl. 132-37.00R.

Idemitsu Kosan Company Limited: *See*—
Hayashida, Shinsaku; Ogata, Seiya; and Yoshino, Sadazo, 4,443,542, Cl. 435-160.000.
Iida, Hiroshi; Iino, Akira; and Honna, Kosaku, 4,443,552, Cl. 502-66.000.

Idemitsu Petrochemical Co., Ltd.: *See*—
Takashige, Masao; Kaneda, Kazuhisa; and Murakami, Naotaka, 4,443,399, Cl. 264-519.000.

Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Flow control valve apparatus. 4,442,997, Cl. 251-129.000.

Idriss, Samir F.: *See*—
DeCant, Leonard J., Jr.; and Idriss, Samir F., 4,443,218, Cl. 604-67.000.

Iguchi, Junsuke: *See*—
Miyoshi, Hajime; Asanagi, Etsuo; Iguchi, Junsuke; and Okabayashi, Ikuo, 4,443,260, Cl. 106-109.000.

Iida, Hiroshi; Iino, Akira; and Honna, Kosaku, to Idemitsu Kosan Co., Ltd. Catalysts for the catalytic cracking of heavy oil. 4,443,552, Cl. 502-66.000.

Iijima, Katsumi: *See*—
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.

Iijima, Tokuzo; Samejima, Yasushi; and Kano, Toshiji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Finger type electrolytic cell for the electrolysis of an aqueous alkali metal chloride solution. 4,443,315, Cl. 204-253.000.

Iino, Akira: *See*—
Iida, Hiroshi; Iino, Akira; and Honna, Kosaku, 4,443,552, Cl. 502-66.000.

Ikeda Bussan Co., Ltd.: *See*—
Ikeda, Hisashi; and Hosoda, Yuuichi, 4,443,286, Cl. 156-245.000.

Ikeda, Hisashi; and Hosoda, Yuuichi, to Ikeda Bussan Co., Ltd. Method of making cushion material from foam slabs and comminuted soft foam scrap. 4,443,286, Cl. 156-245.000.

Ikeda, Masashi: *See*—
Kihara, Kazuo; and Ikeda, Masashi, 4,443,808, Cl. 357-15.000.

Ikeda, Tadashi: *See*—
Kojima, Tetsuro; Ishimaru, Shingo; Sugimoto, Naohiko; and Ikeda, Tadashi, 4,443,534, Cl. 430-512.000.

Ikeda, Toshiaki; Furuichi, Shuhei; and Suzuki, Masakazu, to Kabushiki Kaisha Morita Seisakusho. DC High voltage generator for a dental X-ray photographing apparatus. 4,443,843, Cl. 363-59.000.

Ikegami, Shigeru; and Ohsaki, Takashi, to Toho Beslon Co., Ltd.; Japan Marine Machinery Development Assoc.; and Sumitomo Heavy Industries, Ltd. Brushes and method for the production thereof. 4,443,726, Cl. 310-248.000.

Ikegawa, Masato; Tojo, Kenji; and Shiibayashi, Masao, to Hitachi, Ltd. Scroll fluid apparatus with an arcuate recess adjacent the stationary wrap. 4,443,166, Cl. 418-55.000.

Imagawa, Kyoshiro: *See*—
Sakuragi, Shiro; Imagawa, Kyoshiro; Kotani, Haruo; Saito, Mitsunori; and Haga, Tomoyuki, 4,443,684, Cl. 219-121.0LH.

Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, to Hitachi, Ltd. High-breakdown-voltage semiconductor device. 4,443,812, Cl. 357-53.000.

Imchemie Kunststoff GmbH: *See*—
Melchior, Bernd, 4,443,391, Cl. 264-22.000.

Imperial Chemical Industries PLC: *See*—
Brittain, David R.; and Wood, Robin, 4,443,465, Cl. 424-273.00R.
Davies, David H.; and Smithers, Michael J., 4,443,471, Cl. 424-279.000.
Worthington, Paul A., 4,443,454, Cl. 424-263.000.
Worthington, Paul A., 4,443,455, Cl. 424-263.000.

In-Tex Tool Corporation: *See*—
Eash, Joseph D., 4,443,139, Cl. 408-14.000.

Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Exhaust recirculation system for internal combustion engines. 4,442,820, Cl. 123-571.000.

Inco Research & Development Center, Inc.: *See*—
Floreen, Stephen, 4,443,254, Cl. 75-123.00B.

Indianapolis Center for Advanced Research, Inc.: *See*—
Hogan, Robert D., Jr.; Sanghvi, Narendra T.; and Morris, Richard F., 4,443,816, Cl. 358-160.000.

Infusaid Corporation: *See*—
DeCant, Leonard J., Jr.; and Idriss, Samir F., 4,443,218, Cl. 604-67.000.

Ingenior F. Selmer A/S: *See*—
Olsen, Olav, 4,443,131, Cl. 405-203.000.

Ingenior Thor Furuholmen A/S: *See*—
Olsen, Olav, 4,443,131, Cl. 405-203.000.

Inoue, Ryuzaburo: *See*—
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Inoue, Ryuzaburo, 4,442,821, Cl. 123-639.000.

Inoue, Toshio: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.

Insituform International N.V.: *See*—
Wood, Eric, 4,442,891, Cl. 166-55.200.

Institut National de la Recherche Agronomique: *See*—
Gouet, Philippe; Contrepois, Michel G.; Dubourguier, Henri-Charles; Girardeau, Jean-Pierre; Goby, Hubert L. J.; Goby, Therese M.; Goby, Anne M.; and Goby, Genevieve, 4,443,547, Cl. 435-253.000.

Instrumentation Laboratory Inc.: *See*—
Weinberg, Melvin S.; and Cormier, Alan D., 4,443,407, Cl. 422-68.000.

Interglas-Textil GmbH.: *See*—
Schmolmann, Horst; and Schmolmann nee Holstein, Renate, 4,443,506, Cl. 428-102.000.

International Business Machines Corporation: *See*—
Bradley, David J.; Eggebrecht, Lewis C.; Gibbs, Dennis S.; and Kostuch, Donald J., 4,443,847, Cl. 364-200.000.
Busch, Dennis G.; Grafe, Robert J.; and Leikam, Gary E., 4,443,863, Cl. 364-900.000.
Doo, Ven Y.; and Tsang, Paul J., 4,442,589, Cl. 29-571.000.
Frater, Norman K.; Gill, Gregory G.; and Watrous, Robert B., 4,443,824, Cl. 360-104.000.
Gendler, Paul L.; and Twieg, Robert, 4,443,302, Cl. 204-2.000.
Zingher, Arthur R., 4,443,278, Cl. 156-64.000.

International Flavors & Fragrances Inc.: *See*—
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,443,633, Cl. 568-445.000.

International Minerals & Chemical Corp.: *See*—
Hodge, Edward B.; and Wolfrom, Glen W., 4,443,470, Cl. 424-279.000.
Nooden, Robert A., 4,443,259, Cl. 106-38.270.

International Technidyne, Inc.: *See*—
Mintz, Michael D., 4,443,408, Cl. 422-73.000.

International Telephone and Telegraph Corporation: *See*—
Biswas, Dipak R.; and Nath, Dilip K., 4,443,239, Cl. 65-3.110.
Blausten, Edmond J., 4,443,875, Cl. 370-60.000.
Oeschger, Joseph E., 4,443,672, Cl. 200-144.00B.
Saccocio, Edward J.; and Holycross, Mark E., 4,443,409, Cl. 422-186.040.

InterNorth, Inc.: *See*—
Jones, Brian L.; Johnson, David L.; and Moseman, Merlin H., 4,442,697, Cl. 73-12.000.

INTEROX (Societe Anonyme): *See*—
Stas, Georges; and Biver, Christian, 4,443,342, Cl. 210-759.000.

Interpace Corporation: *See*—
Tatem, William A., 4,443,659, Cl. 174-140.00C.

Ioannides, Socrates A.: *See*—
Lindsey, Stanley D.; Ioannides, Socrates A.; Horner, Jack R.; Denton, William S.; Shell, Donald P.; and Bebb, Hubert, 4,442,639, Cl. 52-73.000.

Ioffe, Vladimir F.: *See*—
Alexandrov, Vladimir N.; Ioffe, Vladimir F.; and Filatov, Oleg V., 4,443,735, Cl. 313-345.000.

Ioffe, Zosim: *See*—
Maurer, Donald D.; Swift, David E.; and Ioffe, Zosim, 4,442,839, Cl. 128-419.00R.

Isaacson, Bruce G.; Gruetzmacher, Ralph W.; and Schroeder, Kenneth W., to Magnaflux Corporation. Magnetizing current supply for magnetic particle inspection with SCR's connected to three-phase secondary windings for rectification and control. 4,443,759, Cl. 324-216.000.

Isaacson, Douglas T., to Halland, Bruce. Axially moveable auger. 4,443,149, Cl. 414-326.000.

ISCAR Hartmetall Gesellschaft mit beschrankter Haftung: *See*—
Kemmer, Klaus, 4,443,136, Cl. 407-72.000.
Ishibashi, Hideyuki, to Bridgestone Cycle Co., Ltd. Method and device for displacing the head tube of a bicycle. 4,443,023, Cl. 280-278.000.
Ishida, Yasuhiko: *See*—
Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, 4,442,820, Cl. 123-571.000.
Ishido, Yoshinobu; and Tanaka, Hideo, to Hayakawa Rubber Company Limited. Aqueously-swelling water stopper and a process of stopping water thereby. 4,443,019, Cl. 277-227.000.
Ishidoh, Takanobu: *See*—
Mutoh, Masayuki; Ishidoh, Takanobu; and Hayashi, Toshihiro, 4,443,820, Cl. 358-296.000.
Ishigaki, Tsuneo: *See*—
Fujitani, Hidetsugu; Ishigaki, Tsuneo; and Tokuda, Tetsuro, 4,443,775, Cl. 335-281.000.
Ishihama, Hiroshi: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,443,603, Cl. 544-373.000.
Ishii, Satoshi; and Koinuma, Hirosi, to Pioneer Electronic Corporation. Power amplifier. 4,443,771, Cl. 330-297.000.
Ishii, Toshihiko: *See*—
Sato, Tadao; Ishii, Toshihiko; and Setaka, Nobuo, 4,443,420, Cl. 423-290.000.
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Moriyama, Satoru; Chono, Tadashi; and Uchiyama, Tsugio, to Hokko Chemical Industry Co., Ltd. Pesticidal phenylthionophosphonic acid esters. 4,443,439, Cl. 424-211.000.
Ishikawa, Kiyofumi: *See*—
Yano, Mitsuo; Yoshizawa, Junji; Ishikawa, Kiyofumi; Harada, Nobuo; and Matsumoto, Ikuo, 4,443,459, Cl. 424-266.000.
Ishimaru, Shingo: *See*—
Kojima, Tetsuro; Ishimaru, Shingo; Sugimoto, Naohiko; and Ikeda, Tadashi, 4,443,534, Cl. 430-512.000.
Ishizaka, Hideo: *See*—
Muramoto, Yutaka; Kobayashi, Susumu; and Ishizaka, Hideo, 4,443,117, Cl. 374-1.000.
Ishizuka, Kachu: *See*—
Alexander, David H.; Ishizuka, Kachu; and Sato, Robert N., 4,443,107, Cl. 356-373.000.
Isome, Yasuo; Minami, Toshio; and Takahashi, Tadahiko, to Asahi Kasei Kogyo Kabushiki Kaisha; and SNIA Viscosa S.p.A. Viscose rayon filment yarn and process for producing same. 4,443,596, Cl. 536-60.000.
Itabashi, Tatsuo, to Mitutoyo Mfg. Co., Ltd. Projecting apparatus. 4,443,076, Cl. 353-101.000.
Itek Corporation: *See*—
Breslow, Donald H., 4,443,788, Cl. 340-347.00P.
Ito, Shuzo: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.
Ito, Sumio: *See*—
Nohira, Hidetaka; Ito, Sumio; and Oki, Hisashi, 4,442,809, Cl. 123-316.000.
Ito, Susumu: *See*—
Murata, Moriyasu; Suzuki, Akira; Nakae, Atsuo; and Ito, Susumu, 4,443,355, Cl. 252-174.120.
Ito, Tadashi: *See*—
Hosoe, Kazuya; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; Kawabata, Takashi; and Ito, Tadashi, 4,443,086, Cl. 354-409.000.
Itobayashi, Manabu; and Ohtawa, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Automatic level control circuit. 4,443,770, Cl. 330-284.000.
Itoh, Takaaki: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, 4,443,388, Cl. 261-39.00A.
Itoh, Takayuki, to Asahi Kogaku Kogyo Kabushiki Kaisha. Reflecting telephoto zoom lens system. 4,443,068, Cl. 350-423.000.
Iwai, Sakuya; and Kajikawa, Teruo, to Nippon Oil Co., Ltd. Composition for backing carpets. 4,443,575, Cl. 524-486.000.
Iwami, Isamu: *See*—
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, 4,443,380, Cl. 260-429.200.
Iwamoto, Noritada: *See*—
Oshima, Tokio; Kimura, Tomio; Omata, Te..uo; and Iwamoto, Noritada, 4,443,548, Cl. 435-280.000.
Iwamoto, Yasuhiko, to Meinan Machinery Works, Inc. Veneer reeling unit. 4,442,982, Cl. 242-55.000.
Iwanaga, Kouichi: *See*—
Nasu, Sataroh; Iwanaga, Kouichi; and Kikuchi, Hiroshi, 4,442,596, Cl. 30-41.500.
Iwano, Yoshimi: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; Iwano, Yoshimi; and Kimbara, Masahiko, 4,442,871, Cl. 139-435.000.
Iwasaki, Hiroshi: *See*—
Kondo, Mitsuru; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,443,614, Cl. 548-469.000.
Iwata, Hiroshi: *See*—
Kashihara, Toshitsugu; Yoshino, Tsunemi; Morioka, Akitoshi; and Iwata, Hiroshi, 4,443,087, Cl. 354-401.000.
Iwata, Kazuroh: *See*—
Fukushima, Naoto; Iwata, Kazuroh; Hidaka, Kunihiko; and Yabuta, Keiichiro, 4,442,925, Cl. 188-282.000.
Izu, Masatsugu; Nath, Prem; and Holland, Arthur, to Energy Conversion Devices, Inc. Electrically interconnected large area photovoltaic cells and method of producing said cells. 4,443,652, Cl. 136-251.000.
Izumi, Yoshitaka, to Kimura Bed Mfg. Company Limited. Suction type urinating aid. 4,443,217, Cl. 604-73.000.
J. M. Huber Corporation: *See*—
Kostinko, John A., 4,443,422, Cl. 423-329.000.
J. Strobel & Sohne GmbH & Co.: *See*—
Hauser, Georg; and Hoggenstaller, Rolf, 4,442,616, Cl. 38-14.000.
J. T. Baker Chemical Co.: *See*—
Browne, Lloyd E., 4,442,624, Cl. 43-107.000.
Jackovitz, John F.; Seidel, Joseph; and Pantier, Earl A., to Westinghouse Electric Corp. $NiCO_3$ Electrode material and electrode. 4,443,526, Cl. 429-223.000.
Jacobson, Alexander D.: *See*—
Grinberg, Jan; Waldner, Michael; Braatz, Paul O.; and Jacobson, Alexander D., 4,443,064, Cl. 350-334.000.
Jacobson, Chester F., to Gillette Company, The. Razor blade assembly. 4,442,598, Cl. 30-47.000.
Jacovides, Linos J.; and Woods, Edward J., to General Motors Corporation. Method of induction brazing a complex assembly. 4,443,678, Cl. 219-10.410.
Jagenberg Werke AG: *See*—
Kolges, Wilhelm; and Zodrow, Rudolph, 4,443,289, Cl. 156-384.000.
Jahnel, Ernst, to Zahnraderfabrik Renk A.G. Clutched multiple branch gear transmission system and method. 4,442,728, Cl. 74-361.000.
James River-Dixie/Northern, Inc.: *See*—
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,297, Cl. 162-101.000.
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.
Janda, Bruce W.: *See*—
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,297, Cl. 162-101.000.
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.
Jankovsky, Frantisek, to Sulzer Brothers Limited. Brake for a gripper projectile of a weaving machine. 4,442,870, Cl. 139-185.000.
Jansen, Gerardus L. M., to U.S. Philips Corporation. Electrodynamic device for translating an objective. 4,443,721, Cl. 310-14.000.
Jansen, Lawrence G.: *See*—
Minter, Thomas F.; Jansen, Lawrence G.; and Springford, Richard H., 4,442,618, Cl. 40-587.000.
Janssen Pharmaceutica N.V.: *See*—
Kennis, Ludo E. J.; and Mertens, Josephus C., 4,443,451, Cl. 424-251.000.
Japan Marine Machinery Development Assoc.: *See*—
Ikegami, Shigeru; and Ohsaki, Takashi, 4,443,726, Cl. 310-248.000.
Japan Styrene Paper Corporation: *See*—
Akiyama, Hiroyuki; Kuwabara, Hideki; Yamaguchi, Toru; and Kishida, Masahiko, 4,443,393, Cl. 264-53.000.
Jarvis A. N. Z. Pty. Limited: *See*—
Byrne, Richard F.; and Pierce, Samuel E., 4,442,602, Cl. 30-180.000.
Jean Walterscheid GmbH: *See*—
Buthe, Theo; and Mikeska, Felix, 4,443,207, Cl. 464-172.000.
Jeffery, James E.; and Wilmshurst, Eric C., to Boots Company Limited, The. Arylcyclobutylalkylamines and anti-depression composition and methods using same. 4,443,449, Cl. 424-250.000.
Jenkins Metal Corporation: *See*—
Collins, Walter W., 4,442,559, Cl. 7-158.000.
Jennings, Richard E., to Sperry Corporation. Method and apparatus for converting a harvesting machine between operating and transport positions. 4,442,662, Cl. 56-228.000.
Jentzsch, Arndt; Johne, Hans; and Muller, Wolfgang, to Veb Kombinat Polygraph "Werner Lamberz". Device for adjusting an ink knife in an ink-applicator of a printing machine. 4,442,775, Cl. 101-365.000.
Jessee, Ralph D., to Westinghouse Electric Corp. Inverter firing control with compensation for variable switching delay. 4,443,842, Cl. 363-41.000.
Jeumont-Schneider Corporation: *See*—
Laurent, Daniel M.; and Theze, Claude, 4,442,988, Cl. 246-34.0CT.
Jezbera, Vladimir K. Robotics positioning system. 4,442,754, Cl. 91-1.000.
Jidosha Kiki Co., Ltd.: *See*—
Masuda, Naosuke; and Ohe, Takeshi, 4,443,161, Cl. 417-310.000.
Ohe, Takeshi; and Okamoto, Haruo, 4,442,857, Cl. 137-117.000.
Jirinec, Michael J.: *See*—
Kushner, Burton A.; and Jirinec, Michael J., 4,443,521, Cl. 428-679.000.
Jobst Institute, Inc.: *See*—
Tucker, Kevin M.; and Sandman, Terry L., 4,442,834, Cl. 128-90.000.
Jochum, Peter: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, 4,443,587, Cl. 526-146.000.
Johannsmeier, Karl-Heinz; and Phillips, Edward H., to Optimetrix Corporation. On machine reticle inspection device. 4,443,096, Cl. 355-53.000.
Johannson, Richard J., to Towmotor Corporation. Adjustable slider bearing assembly. 4,442,922, Cl. 187-9.00E.

Johansen, Richard P.: *See*—
Miller, Michael A.; and Johansen, Richard P., 4,443,341, Cl. 210-702.000.

John Wyeth & Brother Limited: *See*—
Ward, Terence J., 4,443,461, Cl. 424-267.000.
Ward, Terence J., 4,443,467, Cl. 424-274.000.

Johne, Hans: *See*—
Jentzsch, Arndt; Johne, Hans; and Muller, Wolfgang, 4,442,775, Cl. 101-365.000.

Johns Hopkins University, The: *See*—
Keller, Christian A., 4,443,699, Cl. 250-227.000.

Johns, Kenneth H.: *See*—
Herman, Fred L.; and Johns, Kenneth H., 4,442,703, Cl. 73-49.500.

Johnsen, John A.: *See*—
Loeffler, Earl F.; Barrickman, Stephen R.; and Johnsen, John A., 4,443,290, Cl. 156-396.000.

Johnson, David L.: *See*—
Jones, Brian L.; Johnson, David L.; and Moseman, Merlin H., 4,442,697, Cl. 73-12.000.

Johnson, Donald R.: *See*—
Chait, Edward M.; Gianelli, Mary L.; and Johnson, Donald R., 4,443,319, Cl. 204-299.00R.

Johnson & Johnson Baby Products Company: *See*—
Guth, Jacob J.; and Verdicchio, Robert J., 4,443,362, Cl. 252-545.000.

Johnson, Randy W.: *See*—
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,443,450, Cl. 424-250.000.

Johnson, Rick A. Juice press. 4,442,767, Cl. 100-116.000.

Johnson, Rubein V. Vented acoustic ear mold for hearing aids. 4,442,917, Cl. 181-135.000.

Jones, Brian L.; Johnson, David L.; and Moseman, Merlin H., to Inter-North, Inc. Pre-stressed impact testing device. 4,442,697, Cl. 73-12.000.

Jones, Bruce B., to United States of America, Air Force. Detonator block. 4,442,776, Cl. 102-275.120.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,443,644, Cl. 585-500.000.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,443,645, Cl. 585-500.000.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,443,646, Cl. 585-500.000.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,443,647, Cl. 585-500.000.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,443,648, Cl. 585-500.000.

Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,443,649, Cl. 585-500.000.

Jones, George V.: *See*—
Hammond, Wayne H.; and Jones, George V., 4,443,600, Cl. 544-190.000.

Jones, James J.: *See*—
Sahay, Bharat B.; and Jones, James J., 4,442,972, Cl. 236-1.0EA.

Jones, Robert M.: *See*—
Fick, Bruce R.; and Jones, Robert M., 4,442,665, Cl. 60-39.120.

Jones, Stanley P., to Emhart Industries, Inc. Method of and apparatus for monitoring the closing action of a mould. 4,443,241, Cl. 65-29.000.

Jons, Claus: *See*—
Dworak, Wilhelm; Fader, Martin; Jons, Claus; Mayer, Siegfried; Muller, Karl-Heinz; Rasper, Manfred; Schuldt, Dietrich; Talmos, Wolfgang; and Wolff, Guenter, 4,443,168, Cl. 418-131.000.

Josien, Daniel: *See*—
de Sivry, Bruno J. M.; Migliarese-Caputi, Jean-Louis; and Josien, Daniel, 4,442,867, Cl. 138-93.000.

Jostad, Ray E.: *See*—
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,297, Cl. 162-101.000.
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.

Jourdain, Philippe; Florens, Georges E., deceased; and Souquet, Georges A. L., representative, to U.S. Philips Corporation. Method of simultaneously manufacturing multiple electrical connections between two electrical elements. 4,442,966, Cl. 228-123.000.

Jouve, Hubert: *See*—
Boshra-Riad, Mokhtar; Fedeli, Jean-Marc; Jouve, Hubert; and Mauduit, Daniel, 4,443,867, Cl. 365-19.000.

Joy, David C.; Kaplan, Martin L.; and Schmidt, Paul H., to Bell Telephone Laboratories, Incorporated. Induced crystallographic modification of aromatic compounds. 4,443,532, Cl. 430-270.000.

Jubenville, Duncan B., to TekSonix, Inc. Continuous process and apparatus for separating hydrocarbons from earth particles and sand. 4,443,322, Cl. 208-11.0LE.

Jukes, Christoher E., to Mod-Lok Industries, Ltd. Frame member for use with construction blocks. 4,442,644, Cl. 52-213.000.

Julien Saint Amand, Francois, to Centre Technique de l'Industries des Papiers Carton et Celluloses. Process and device for separating particles in a fluid especially for the cleaning of the suspensions handled in the paper industry. 4,443,331, Cl. 209-211.000.

Junck, Gunter; Seidel, Hans; and Varona, Jesus, to Gebr. Hofmann GmbH & Co. KG, Maschinenfabrik. Method and apparatus for correcting the unbalance present in a rotor. 4,442,712, Cl. 73-462.000.

Jung, Eggert; and Wadle, Heinrich, to Dr. -Ing. Rudolf Hell GmbH. Run-free color raster for multi-color printing. 4,443,060, Cl. 350-317.000.

Kabushiki Kaisha Daikin Seisakusho: *See*—
Uchida, Shinobu, 4,442,929, Cl. 192-52.000.

Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Fukuda, Masao, 4,442,911, Cl. 177-165.000.
Mikami, Yoshiharu, 4,442,910, Cl. 177-25.000.
Sashiki, Takashi; and Sakaeda, Keiko, 4,442,932, Cl. 198-366.000.

Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Ezawa, Sadaaki, 4,442,751, Cl. 84-1.250.

Kabushiki Kaisha Kobe Seiko Sho: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tsuzuki, Hidehiro; Tabuchi, Takahisa; Masuda, Tsunehara; and Takehata, Tetsuro, deceased, 4,443,143, Cl. 409-295.000.
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.

Kabushiki Kaisha Morita Seisakusho: *See*—
Ikeda, Toshiaki; Furuichi, Shuhei; and Suzuki, Masakazu, 4,443,843, Cl. 363-59.000.
Matsui, Takahiro, 4,443,195, Cl. 433-84.000.

Kabushiki Kaisha Nihon Plant Service Center: *See*—
Shinno, Kiyonori, 4,443,498, Cl. 427-235.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Hirano, Seiichi, 4,443,125, Cl. 400-328.000.
Koto, Haruhiko, 4,443,807, Cl. 346-140.00R.

Kabushiki Kaisha Tokyo Kikai Seisakusho: *See*—
Kobayashi, Haruyoshi, 4,442,773, Cl. 101-177.000.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; Iwano, Yoshimi; and Kimbara, Masahiko, 4,442,871, Cl. 139-435.000.

Kaepa, Inc.: *See*—
Dobbin, Thomas M., 4,442,613, Cl. 36-50.000.

Kagan, Michael A.: *See*—
Shaftner, Robert S.; Chambers, Norman D.; Kagan, Michael A.; and Briggs, Eugene C., 4,443,187, Cl. 432-222.000.

Kagemoto, Akira: *See*—
Sunahara, Noriyuki; Naruto, Shunsuke; Kagemoto, Akira; Kurooka, Shigeru; and Yokogawa, Kanae, 4,443,365, Cl. 260-112.00R.

Kaiser Aluminum & Chemical Corporation: *See*—
Donaldson, Donald J.; Kelly, Allan C.; Mulloy, Joseph W.; and Zwakenberg, Donald R., 4,443,416, Cl. 423-122.000.

Kaiser, Mark E., to Dow Chemical Company, The. Liquid phase preparation of 2-H-2-oxazolines and 2-substituted-2-oxazolines. 4,443,611, Cl. 548-239.000.

Kaiser, Robert G., to Clark & Vicario Corporation. Deaerated liquid stock supply. 4,443,232, Cl. 55-41.000.

Kaitani, Katsumi: *See*—
Tsuda, Masatoshi; Kobayashi, Takeshi; and Kaitani, Katsumi, 4,443,404, Cl. 419-2.000.

Kajikawa, Teruo: *See*—
Iwai, Sakuya; and Kajikawa, Teruo, 4,443,575, Cl. 524-486.000.

Kakimoto, Tetsuya: *See*—
Miyamoto, Yoshikazu; Kakimoto, Tetsuya; and Tanida, Wasaburo, 4,442,953, Cl. 222-14.000.

Kalejs, Juris P., to Mobil Solar Energy Corporation. Apparatus for controlling the atmosphere surrounding a crystal growth zone. 4,443,411, Cl. 422-246.000.

Kali-Chemie AG: *See*—
Rudolph, Werner; and Fernschild, Guenter, 4,442,676, Cl. 60-671.000.

Kallin, Fredrik L. N., to NCR Corporation. Staging apparatus used in a sheet feeding environment. 4,442,769, Cl. 101-93.190.

Kamatani, Yoshio; Tanaka, Michio; and Yamazaki, Kyuya, to Takeda Chemical Industries, Ltd. Composition for polyurethane resins and production of the same. 4,443,590, Cl. 528-51.000.

Kamatani, Yoshio; and Fujita, Noriaki, to Takeda Chemical Industries, Inc. Polyisocyanates. 4,443,597, Cl. 544-67.000.

Kamifuji, Hiroshi: *See*—
Kashiwaya, Mineo; Nakagawa, Tohru; Yamada, Kinsaku; Kamifuji, Hiroshi; Oyama, Yoshishige; Kuroiwa, Hiroshi; and Tsuruta, Hisato, 4,442,818, Cl. 123-494.000.

Kamimura, Kunio: *See*—
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Kanada, Eiji: *See*—
Yamada, Shoji; Kanada, Eiji; and Mathubara, Eiji, 4,443,531, Cl. 430-204.000.

Kanagawa Prefectual Government: *See*—
Ezawa, Masashi; Makino, Hiroshi; and Futami, Tadao, 4,443,054, Cl. 339-273.00R.

Kanamori, Hiroshi; Shigeya, Takehiro; and Aoki, Nobumasa, to Nissan Motor Co., Ltd.; and Marui Industrial Co., Ltd. Self-illuminating ornament for vehicles. 4,443,832, Cl. 362-84.000.

Kanbe, Junichiro; Shirai, Shigeru; and Fukuda, Tadaji, to Canon Kabushiki Kaisha. Photoconductive member having an amorphous silicon photoconductor and a double-layer barrier layer. 4,443,529, Cl. 430-65.000.

Kaneda, Kazuhisa: *See*—
Takashige, Masao; Kaneda, Kazuhisa; and Murakami, Naotaka, 4,443,399, Cl. 264-519.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Iijima, Tokuzo; Samejima, Yasushi; and Kano, Toshiji, 4,443,315, Cl. 204-253.000.

Kaneko, Makoto; and Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Frequency divider for electronic musical instrument. 4,442,748, Cl. 84-1.010.
Kaneko, Noboru; and Tabata, Junichi, to Seiko Instruments & Electronics Ltd. Electronic timepiece with electrochromic display. 4,443,115, Cl. 368-82.000.
Kaneko, Toshimi; and Hata, Yukio, to Murata Manufacturing Co., Ltd. CR Composite part provided with discharge gap. 4,443,830, Cl. 361-275.000.
Kano, Toshiji: *See*—
Iijima, Tokuzo; Samejima, Yasushi; and Kano, Toshiji, 4,443,315, Cl. 204-253.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See*—
Kondo, Mitsuru; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,443,614, Cl. 548-469.000.
Kao Corporation: *See*—
Murata, Moriyasu; Suzuki, Akira; Nakae, Atsuo; and Ito, Susumu, 4,443,355, Cl. 252-174.120.
Kaplan, Martin L.: *See*—
Joy, David C.; Kaplan, Martin L.; and Schmidt, Paul H., 4,443,532, Cl. 430-270.000.
Karjalainen, Arto J.; and Kurkela, Kauko O. A., to Farmos-Yhtyma OY (Farmos Group Ltd.). 4-Benzyl- and 4-benzoyl-substituted imidazole derivatives and use as medicaments. 4,443,466, Cl. 424-274.000.
Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Bergmann, Gerhard; and Hittel, Gerhard, 4,442,684, Cl. 66-84.00A.
Karmiol, Mark H.; Hickernell, Gary L.; and Hall, Bertrand J., to General Foods Corporation. Recovery of caffeine from caffeine adsorbents. 4,443,601, Cl. 544-274.000.
Kasahara, Kanji; and Sakamoto, Akira, to Mitsubishi Monsanto Chemical Company. Thermoplastic resin composition containing metal foil fragments and process for its production. 4,443,565, Cl. 523-137.000.
Kasamatsu, Kiyoshi; Hirano, Masachika; and Okuno, Takeshi, to Sumitomo Chemical Company, Limited. Insecticidal and/or acaricidal composition exhibiting low toxicity to mammals and fish. 4,443,438, Cl. 424-200.000.
Kashihara, Toshitsugu; Yoshino, Tsunemi; Morioka, Akitoshi; and Iwata, Hiroshi, to West Electric Co., Ltd. Focus state indicator. 4,443,087, Cl. 354-401.000.
Kashiwaya, Mineo; Nakagawa, Tohru; Yamada, Kinsaku; Kamifuji, Hiroshi; Oyama, Yoshishige; Kuroiwa, Hiroshi; and Tsuruta, Hisato, to Hitachi, Ltd. Fuel injection apparatus for internal combustion engines. 4,442,818, Cl. 123-494.000.
Katho, Eiichi: *See*—
Senda, Shigeo; Ohtani, Osamu; Katho, Eiichi; Nagasaka, Mitsuaki; Miyake, Hidekazu; Fujiwara, Khosuke; and Tanaka, Motoaki, 4,443,607, Cl. 546-141.000.
Kato, Masayuki: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; and Kato, Masayuki, 4,443,443, Cl. 424-246.000.
Kato, Takashi: *See*—
Horikoshi, Koki; Shibanai, Ichiro; and Kato, Takashi, 4,443,323, Cl. 208-11.0LE.
Kato, Tetsuro, to Sony Corporation. Digital velocity error compensator. 4,443,821, Cl. 358-326.000.
Katoh, Hiroshi; Toyota, Hiromi; Koyama, Kazuo; and Komiya, Kunihiko, to Nippon Steel Corporation. Process for producing cold rolled steel sheets having excellent press formability and ageing property. 4,443,272, Cl. 148-12.00C.
Katou, Takashi: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, 4,443,388, Cl. 261-39.00A.
Katsekas, James C.: *See*—
Derderian, Scott K.; and Katsekas, James C., 4,443,725, Cl. 310-214.000.
Katsumata, Tsutomu: *See*—
Aoki, Kunitoshi; Honda, Makoto; Dozono, Tetsuro; and Katsumata, Tsutomu, 4,443,556, Cl. 502-212.000.
Katuragi Sangyo Co., Ltd.: *See*—
Tsuda, Masatoshi; Kobayashi, Takeshi; and Kaitani, Katsumi, 4,443,404, Cl. 419-2.000.
Kauffman, Kenneth W., to Franklin Institute, The. Variable effect absorption machine and process. 4,442,677, Cl. 60-673.000.
Kaufmann, Heinrich: *See*—
Eisbein, Juergen; Kaufmann, Heinrich; Moser, Kurt; and Brenner, Friedhelm, 4,443,092, Cl. 355-3.00R.
Kawabata, Takashi: *See*—
Hosoe, Kazuya; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; Kawabata, Takashi; and Ito, Tadashi, 4,443,086, Cl. 354-409.000.
Kawabe, Shinichi, to Idea Giken Ltd. Curling iron. 4,442,849, Cl. 132-37.00R.
Kawai, Hisasi: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,442,997, Cl. 251-129.000.
Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, 4,442,820, Cl. 123-571.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph; and Deutsch, Leslie J., 4,442,747, Cl. 84-1.010.
Kawakami, Tomio: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,443,781, Cl. 338-34.000.
Kawamatsu, Yutaka; Saraie, Takahiro; and Yoshikawa, Harutoshi, to Takeda Chemical Industries, Ltd. Herbicidal pyridyl-ethoxy-phenyl urea derivatives. 4,443,246, Cl. 71-94.000.
Kawashima, Yukio; Kobayashi, Makoto; and Murakami, Mayu, to TDK Electronics Co., Ltd. Electrode for electrolysis and process for its production. 4,443,317, Cl. 204-290.00F.
Kawata, Shoji: *See*—
Ohyama, Tadashi; and Kawata, Shoji, 4,442,998, Cl. 251-129.000.
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, to Kabushiki Kaisha Kobe Seiko Sho. Probe and a system for detecting wear of refractory wall. 4,442,706, Cl. 73-86.000.
Kearby, Ronald S.: *See*—
Smith, Burl L.; and Kearby, Ronald S., 4,442,868, Cl. 138-118.100.
Keating, David M.: *See*—
Meisch, Charles E.; and Keating, David M., 4,443,219, Cl. 604-317.000.
Keatley, Lawrence A. Tweezers for the removal of parasites from animals. 4,442,837, Cl. 128-354.000.
Keck, Hermann. Clip for fixing male and female parts of ground glass joints. 4,442,572, Cl. 24-562.000.
Kefalas A/S: *See*—
Bogeso, Klaus P., 4,443,448, Cl. 424-250.000.
Keil, Joseph W., to Dow Corning Corporation. Silicone hydraulic fluids and additive concentrates therefor. 4,443,351, Cl. 252-75.000.
Keith, Alec D., to Key Pharmaceuticals, Inc. Anti-spilling drug capsule. 4,442,941, Cl. 206-540.000.
Keller, Christian A., to Johns Hopkins University, The. Fluid level measuring device with linear, high resolution output. 4,443,699, Cl. 250-227.000.
Kelly, Allan C.: *See*—
Donaldson, Donald J.; Kelly, Allan C.; Mulloy, Joseph W.; and Zwakenberg, Donald R., 4,443,416, Cl. 423-122.000.
Kelly, Charles A. P., to Northern Telecom Inc. Meter to printer coupling circuit. 4,443,758, Cl. 324-113.000.
Kemmer, Josef. Passivated semiconductor pn junction of high electric strength and process for the production thereof. 4,442,592, Cl. 29-572.000.
Kemmer, Klaus, to ISCAR Hartmetall Gesellschaft mit beschrankter Haftung. Machine cutting tool. 4,443,136, Cl. 407-72.000.
Kennis, Ludo E. J.; and Mertens, Josephus C., to Janssen Pharmaceutica N.V. Bicyclic pyrimidin-5-one derivatives. 4,443,451, Cl. 424-251.000.
Kent, John E. Self-propelled troller. 4,442,621, Cl. 43-26.100.
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., to Monsanto Company. Attrition resistant metal/oxygen compositions. 4,443,642, Cl. 585-428.000.
Keppel, Robert A.: *See*—
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,443,641, Cl. 585-428.000.
Kerby, Robert C., to Cominco Ltd. Controlling metal electro-deposition using electrolyte containing two polarizing agents. 4,443,301, Cl. 204-1.00T.
Kerilea Cloche Limited: *See*—
Hammond, Errol C., 4,442,626, Cl. 47-29.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Struck, Bernd D., 4,443,316, Cl. 204-263.000.
Ketley, Arthur D.: *See*—
Morgan, Charles R.; and Ketley, Arthur D., 4,443,495, Cl. 427-96.000.
Ketschker, Walter; Marquart, Reinhard; and Stenert, Alois, to Hoesch Werke AG. Stabilized bearing for bogies. 4,443,045, Cl. 308-223.000.
Ketting, Leendert: *See*—
Oetiker, Hans; Linzberger, Robert; Ketting, Leendert; and Winteler, Werner, 4,442,980, Cl. 241-34.000.
Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D., 4,442,941, Cl. 206-540.000.
Kieninger & Obergfell: *See*—
Fehrenbacher, Wolfgang; Heinzelmann, Hans; and Scheer, Erich, 4,443,113, Cl. 368-72.000.
Kierstead, Richard W.: *See*—
Guthrie, Robert W.; Kierstead, Richard W.; Mennona, Francis A.; and Sullivan, Ann C., 4,443,619, Cl. 549-518.000.
Kihara, Kazuo; and Ikeda, Masashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device. 4,443,808, Cl. 357-15.000.
Kikkawa, Ikuo: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,443,598, Cl. 544-90.000.
Kikuchi, Hiroshi: *See*—
Nasu, Sataroh; Iwanaga, Kouichi; and Kikuchi, Hiroshi, 4,442,596, Cl. 30-41.500.
Kim, Bang M., to General Electric Company. Process for separation of molybdenum from tungsten leachates. 4,443,414, Cl. 423-54.000.
Kimbara, Masahiko: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; Iwano, Yoshimi; and Kimbara, Masahiko, 4,442,871, Cl. 139-435.000.
Kimberly-Clark Corporation: *See*—
Bolick, Martha E.; Weber, Rebecca J.; and Lang, Theodore B., 4,442,552, Cl. 2-49.00R.
Meitner, Gary H.; and Notheis, Patrick J., 4,443,513, Cl. 422-195.000.
Kimura Bed Mfg. Company Limited: *See*—
Izumi, Yoshitaka, 4,443,217, Cl. 604-73.000.

Kimura, Masatoshi: *See*—
Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,443,812, Cl. 357-53.000.
Kimura, Shigeru, to Nifco Inc. Retainer device for car wind-up window. 4,442,634, Cl. 49-493.000.
Kimura, Tomio: *See*—
Oshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,443,548, Cl. 435-280.000.
King, Arthur S. Liquid treater having electrical charge injection means. 4,443,320, Cl. 204-302.000.
King, Francis G.: *See*—
Gable, Stewart V.; and King, Francis G., 4,442,708, Cl. 73-117.000.
King, William H., to Exxon Research and Engineering Co. Method for determining minimum lubricating oil-film thickness under operating engine conditions using electrical capacitance. 4,443,754, Cl. 324-61.00R.
Kinoshita, Takao: *See*—
Hosoe, Kazuya; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; Kawabata, Takashi; and Ito, Tadashi, 4,443,086, Cl. 354-409.000.
Kirihara, Seishin: *See*—
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.
Kiritani, Masataka; and Asao, Yasuzi, to Fuji Photo Film Co., Ltd. Photographic resin-coated paper. 4,443,535, Cl. 430-538.000.
Kirkhuff, Shield & Fink: *See*—
Kirkhuff, William J., 4,443,258, Cl. 106-18.120.
Kirkhuff, William J., to Kirkhuff, Shield & Fink. Fire retardant materials. 4,443,258, Cl. 106-18.120.
Kirschner, Thomas F., to RCA Corporation. Video disc player having caddy lockout mechanism. 4,443,872, Cl. 369-77.200.
Kirst, Herbert A.; and Toth, John E., to Eli Lilly and Company. C-20-Modified macrolide derivatives of the macrolide antibiotics tylosin, desmycosin, macrocin, and lactenocin. 4,443,436, Cl. 424-180.000.
Kishi, Yoshio; and Mine, Norichika, to Sony Corporation. Apparatus for controlling a web transport system. 4,442,985, Cl. 242-186.000.
Kishida, Masahiko: *See*—
Akiyama, Hiroyuki; Kuwabara, Hideki; Yamaguchi, Toru; and Kishida, Masahiko, 4,443,393, Cl. 264-53.000.
Kishimoto, Tomio: *See*—
Nakamura, Noriaki; Kishimoto, Tomio; and Yamamoto, Yuichi, 4,443,670, Cl. 200-11.0DA.
Kissling, Bruno; Knobel, Walter; and Robinson, Tibor, to Sandoz Ltd. Composition and method for improving the fastness of direct and reactive dyeings on cellulose-containing substrates. 4,443,223, Cl. 8-496.000.
Kistner, Herbert: *See*—
Sternisa, Danilo; and Kistner, Herbert, 4,443,567, Cl. 523-211.000.
Kitahama, Yoshiharu: *See*—
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, 4,443,380, Cl. 260-429.200.
Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Tool cooling device for machine tools. 4,442,576, Cl. 29-39.000.
Kitamura Machinery Co., Ltd.: *See*—
Kitamura, Koichiro, 4,442,576, Cl. 29-39.000.
Kitamura, Minoru: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.
Kitamura, Mitsuaki; Nakayama, Toshio; Kamimura, Kunio; Seo, Iwao; and Yaguchi, Tomonobu, to Mitsubishi Petrochemical Co., Ltd. Biological piezoelectric transducer device for the living body. 4,443,730, Cl. 310-330.000.
Kitamura, Takashi, to Canon Kabushiki Kaisha. Apparatus for controlling the quantity of light. 4,443,695, Cl. 250-205.000.
Kitaori, Kazuhiko: *See*—
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Moriyama, Satoru; Chono, Tadashi; and Uchiyama, Tsugio, 4,443,439, Cl. 424-211.000.
Kiyota, Kazushige: *See*—
Horiuchi, Tatsuo; and Kiyota, Kazushige, 4,443,836, Cl. 362-375.000.
Kliewer, Wayne R.: *See*—
Pesa, Frederick A.; Graham, Anne M.; and Kliewer, Wayne R., 4,443,639, Cl. 568-885.000.
Klinger, Wolfgang; and Milewski, Eckhard, to Hoechst Aktiengesellschaft. Detergent composition for cleaning hard surfaces and method of using the same. 4,443,363, Cl. 252-547.000.
Klinger, Wolfgang; and Milewski, Eckhard, to Hoechst Aktiengesellschaft. Detergent composition containing an antifoaming agent for cleaning hard surfaces and method of using the same. 4,443,364, Cl. 252-547.000.
Klockner-Becorit GmbH: *See*—
Schungel, Peter, 4,443,016, Cl. 277-73.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Tholen, Paul, 4,442,803, Cl. 123-41.690.
Klockner-Werke Aktiengesellschaft: *See*—
Gross, Reinhold; Willuhn, Dietrich; and Witte, Horst, 4,443,134, Cl. 405-288.000.
Klokova, Nadezhda P.: *See*—
Komarova, Galina N.; Klokova, Nadezhda P.; Podboronov, Boris P.; and Piskov, Georgy M., 4,442,718, Cl. 73-766.000.
Klose, Dirk R.; and Skudera, Jr. William J., to United States of America, Army. Direction finding and frequency identification method and apparatus. 4,443,801, Cl. 343-442.000.
Knecht, Adolph; Schneider, Michael; and Ambrosch, Walter, to Warner-Lambert Company. Antacid material based on magnesium aluminum hydroxide and preparation thereof. 4,443,433, Cl. 424-157.000.
Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Process for preparing an indenedione and a mycobacterium culture therefor. 4,443,541, Cl. 435-149.000.
Knipp, Jerry L.: *See*—
Cuminale, Raymond J.; Otto, Stanley W.; Knipp, Jerry L.; Seibolt, Bernard P.; and Yarkoni, Fred E., 4,442,942, Cl. 211-163.000.
Knobbout, Huibert A.: *See*—
van de Pas, Hermanus A.; and Knobbout, Huibert A., 4,442,967, Cl. 228-159.000.
Knobel, Walter: *See*—
Kissling, Bruno; Knobel, Walter; and Robinson, Tibor, 4,443,223, Cl. 8-496.000.
Knoll International, Inc.: *See*—
Hannah, Bruce H., 4,443,046, Cl. 312-183.000.
Knott, Henry J., to Federal-Mogul Corporation. Annular seal. 4,443,017, Cl. 277-152.000.
Kobayashi, Haruyoshi, to Kabushiki Kaisha Tokyo Kikai Seisakusho. Printing mode shifting device for blanket cylinders in offset rotary press. 4,442,773, Cl. 101-177.000.
Kobayashi, Kunio: *See*—
Nakajima, Kaoru; Kobayashi, Kunio; and Hisagen, Yoshiaki, 4,443,490, Cl. 427-44.000.
Kobayashi, Makoto: *See*—
Kawashima, Yukio; Kobayashi, Makoto; and Murakami, Mayu, 4,443,317, Cl. 204-290.00F.
Kobayashi, Masayoshi; Oshizawa, Hidekazu; Okamoto, Kenji; and Sekiguchi, Akira, to Diesel Kiki Co., Ltd. Control apparatus for internal combustion engine. 4,443,852, Cl. 364-431.030.
Kobayashi, Susumu: *See*—
Muramoto, Yutaka; Kobayashi, Susumu; and Ishizaka, Hideo, 4,443,117, Cl. 374-1.000.
Kobayashi, Takeshi: *See*—
Tsuda, Masatoshi; Kobayashi, Takeshi; and Kaitani, Katsumi, 4,443,404, Cl. 419-2.000.
Koda, Toyomasa: *See*—
Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,443,812, Cl. 357-53.000.
Koehring Company: *See*—
Shaftner, Robert S.; Chambers, Norman D.; Kagan, Michael A.; and Briggs, Eugene C., 4,443,187, Cl. 432-222.000.
Koenig, Richard G.: *See*—
Kovit, Bernard; Koenig, Richard G.; and Kress, Robert W., 4,443,014, Cl. 273-363.000.
Kohama, Tokio: *See*—
Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, 4,442,820, Cl. 123-571.000.
Koide, Huminori: *See*—
Yoshino, Masaki; Oka, Kozo; and Koide, Huminori, 4,443,093, Cl. 355-3.0CH.
Koike, Masaru; Hasegawa, Yasumasa; Shimosaka, Satoru; Aoyama, Nagara; and Yoshizumi, Toshihiko, to Meinan Machinery Works, Inc. Apparatus for drying veneer sheet. 4,442,876, Cl. 144-2.00R.
Koike, Tsutomu, to Toku Kabushiki Kaisha. Miniature transformer. 4,443,777, Cl. 336-65.000.
Koinuma, Hirosi: *See*—
Ishii, Satoshi; and Koinuma, Hirosi, 4,443,771, Cl. 330-297.000.
Koinuma, Toyoji: *See*—
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,443,496, Cl. 427-140.000.
Koizumi, Katsuo: *See*—
Moriguchi, Seki; Koizumi, Katsuo; and Nagayama, Sueji, 4,442,878, Cl. 145-4.000.
Kojima, Hirotaka: *See*—
Uehara, Masaru; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,442,841, Cl. 128-635.000.
Kojima, Kiyoshi: *See*—
Sanai, Susumu; and Kojima, Kiyoshi, 4,443,276, Cl. 148-31.570.
Kojima, Tetsuro; Ishimaru, Shingo; Sugimoto, Naohiko; and Ikeda, Tadashi, to Fuji Photo Film Co., Ltd. Silver halide photographic elements containing polymers which filter UV light. 4,443,534, Cl. 430-512.000.
Kokusan Denki Co., Ltd.: *See*—
Kondo, Tetsuya; and Nishi, Tadashi, 4,442,822, Cl. 123-643.000.
Kolges, Wilhelm; and Zodrow, Rudolph, to Jagenberg Werke AG. Labeling machine for objects such as bottles. 4,443,289, Cl. 156-384.000.
Koll, Jochen: *See*—
Wolff, Joachim; Wolf, Karlheinz; Koll, Jochen; Hornle, Reinhold; Mo!ls, Hans-Heinz; and Paulat, Volker, 4,443,225, Cl. 8-549.000.
Koller, Frank J., Jr.: *See*—
Piersol, Jay L.; and Koller, Frank J., Jr., 4,443,262, Cl. 106-209.000.
Komarova, Galina N.; Klokova, Nadezhda P.; Podboronov, Boris P.; and Piskov, Georgy M. Strain gauge and electric circuit for adjustment and calibration of same. 4,442,718, Cl. 73-766.000.
Komiya, Kunihiko: *See*—
Katoh, Hiroshi; Toyota, Hiromi; Koyama, Kazuo; and Komiya, Kunihiko, 4,443,272, Cl. 148-12.00C.

Kondo, Mitsuru; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, to Kanzaki Paper Manufacturing Co., Ltd. Triarylmethane derivatives. 4,443,614, Cl. 548-469.000.

Kondo, Tetsuya; and Nishi, Tadashi, to Kokusan Denki Co., Ltd. Ignition position controlling apparatus for multicylinder internal combustion engine. 4,442,822, Cl. 123-643.000.

Kong, Wendell M. T.: *See*—
Wanuga, Stephen; Kong, Wendell M. T.; and Stearns, Cleo M., 4,442,574, Cl. 29-25.350.

Konigs, Wilhelm: *See*—
Heller, Gerhard; Adelmann, Manfred; Wendorf, Wilfried; and Konigs, Wilhelm, 4,443,174, Cl. 425-147.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Harada, Toshimitsu; and Watanabe, Koji, 4,443,084, Cl. 354-173.110.
Sakurai, Isao; and Minejima, Teruo, 4,443,101, Cl. 355-14.0SH.

Konno, Tatsuo: *See*—
Sunouchi, Akio; Konno, Tatsuo; Fujino, Masahisa; and Suzuki, Ryuji, 4,443,089, Cl. 354-214.000.

Konrad, Charles E., to General Electric Company. Method and apparatus for charge enhancement of a commutating capacitor. 4,443,744, Cl. 318-269.000.

Konter, Wolfgang: *See*—
Musch, Rudiger; Pampus, Gottfried; Muller, Peter; Eisele, Ulrich; Konter, Wolfgang; and Gobel, Wilhelm, 4,443,582, Cl. 525-215.000.

Kool-Fire Limited: *See*—
Vandervaart, Gerry, 4,442,890, Cl. 165-124.000.

Kopetzky, Horst, to Siemens Aktiengesellschaft. Subscriber connection circuit. 4,443,669, Cl. 179-175.20C.

Koppers Company, Inc.: *See*—
Greco, Nicholas P., 4,443,636, Cl. 568-761.000.

Kosmowski, Wojciech B., to Cooper Industries. Pinless pressure foot for machine tool. 4,443,141, Cl. 409-163.000.

Koster, William H.: *See*—
Cimarusti, Christopher M.; Fox, Rita T.; Fritz, Alan W.; Koster, William H.; and Moniot, Jerome L., 4,443,374, Cl. 260-245.400.

Kostinko, John A., to J. M. Huber Corporation. Synthesis of zeolites of small and uniform size having a high magnesium exchange capacity. 4,443,422, Cl. 423-329.000.

Kostuch, Donald J.: *See*—
Bradley, David J.; Eggebrecht, Lewis C.; Gibbs, Dennis S.; and Kostuch, Donald J., 4,443,847, Cl. 364-200.000.

Kosugi, Seiji, to Shoketsu Kinzoku Kogyo Kabushiki Kaisha. Electromagnetic switching valve. 4,442,864, Cl. 137-625.270.

Kotani, Haruo: *See*—
Sakuragi, Shiro; Imagawa, Kyoshiro; Kotani, Haruo; Saito, Mitsunori; and Haga, Tomoyuki, 4,443,684, Cl. 219-121.0LH.

Kotick, Michael P.; and Leland, David L., to Miles Laboratories, Inc. 7β-Arylalkyl-6α, 7 α-oxymethylene-3-methoxy or 3-hydroxy-4, 5α-epoxy-17 methyl or 17-cycloalkyl-methyl morphinans. 4,443,605, Cl. 546-39.000.

Koto, Haruhiko, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet print head. 4,443,807, Cl. 346-140.00R.

Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, to Bayer Aktiengesellschaft; and Strabag Bau-AG. Anchoring of tension members. 4,443,132, Cl. 405-260.000.

Koumura, Noboru: *See*—
Niwa, Yukichi; Ogino, Yasuo; Ohwada, Mitsutoshi; Tanaka, Kazuo; and Koumura, Noboru, 4,443,078, Cl. 354-403.000.

Kovit, Bernard; Koenig, Richard G.; and Kress, Robert W. Combat simulator means. 4,443,014, Cl. 273-363.000.

Kowa Company Limited: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,443,603, Cl. 544-373.000.

Koyama, Kazuo: *See*—
Katoh, Hiroshi; Toyota, Hiromi; Koyama, Kazuo; and Komiya, Kunihiko, 4,443,272, Cl. 148-12.00C.

Kozakae, Kunitoshi, to Bridgestone Cycle Co. Ltd. Speed-change gear mounted outside a bicycle. 4,443,208, Cl. 474-82.000.

Kozawa, Hiroomi: *See*—
Ainoya, Masayuki; Kozawa, Hiroomi; and Chikuzenya, Takao, 4,443,091, Cl. 355-3.0TR.

Kraemer, Walter: *See*—
Bonnekamp, Horst; Sauer, Baldur; Wolkewitz, Heinrich; Hepp, Gunter; and Kraemer, Walter, 4,443,184, Cl. 432-13.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Hofmann, Horst; and Lochner, Karl-Heinz, 4,443,710, Cl. 307-80.000.

Kramer, Hans: *See*—
Hiller, Wolfgang; and Kramer, Hans, 4,442,645, Cl. 52-221.000.

Krause, Dieter, to Siemens Aktiengesellschaft. Mechanical gripping device for rotating jaw chucks or collet chucks. 4,443,020, Cl. 279-1.0DA.

Krauss-Maffei AG: *See*—
Wohlrab, Walter, 4,443,179, Cl. 425-590.000.

Kreijger, Pieter J.; and Buhrmann, Gerardus P., to Hoogovens Groep B.V. Process for producing steel in a converter from pig iron and ferrous scrap. 4,443,252, Cl. 75-48.000.

Kress, Robert W.: *See*—
Kovit, Bernard; Koenig, Richard G.; and Kress, Robert W., 4,443,014, Cl. 273-363.000.

Kresse, Peter: *See*—
Hund, Franz; Hennings, Willi; Brunn, Horst; Kresse, Peter; and Rambold, Wolfgang, 4,443,264, Cl. 106-292.000.

Krogsrud, Harald, to Elkem a/s. Electrothermical furnace. 4,443,879, Cl. 373-71.000.

Krueger, Guenther. Pipe support device for plastic pipe. 4,442,990, Cl. 248-62.000.

Kubis, Charles S.: *See*—
Walter, John; and Kubis, Charles S., 4,442,693, Cl. 72-354.000.

Kubis, Stanley E.: *See*—
Foo, George; Grodkiewicz, Raymond W.; Kubis, Stanley E.; and Lindsay, Gordon C., 4,442,582, Cl. 29-403.300.

Kubo, Hiroshi, to Nippon Electric Co., Ltd. Method of detecting troubles in a receiver for a common control channel of a mobile radio telephone communication system and a system therefor. 4,443,661, Cl. 179-2.0EB.

Kubota Ltd.: *See*—
Yamakami, Yoshiaki; and Yoshimitsu, Arata, 4,442,883, Cl. 164-448.000.

Kubozuka, Takao, to Nissan Motor Co., Ltd. Spark timing control system. 4,442,814, Cl. 123-425.000.

Kuckes, Arthur F., to Cornell Research Foundation, Inc. Method and apparatus for detecting the direction and distance to a target well casing. 4,443,762, Cl. 324-346.000.

Kudo, Akihito. GT-Cut quartz resonator. 4,443,728, Cl. 310-312.000.

Kuhn, John B., to Deere & Company. High lift mechanism for rear end of front mounted mower. 4,442,660, Cl. 56-15.900.

Kuji, Makoto: *See*—
Nakazawa, Hiroshi; and Kuji, Makoto, 4,442,951, Cl. 220-319.000.

Kuka Schweissanlagen + Roboter GmbH: *See*—
Pache, Norbert; and Mazac, Karel, 4,443,686, Cl. 219-123.000.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,442,717, Cl. 73-766.000.
Mallon, Joseph R.; and Kurtz, Anthony D., 4,443,293, Cl. 156-647.000.

Kumalae, Alfred G.: *See*—
Curran, Steven H.; and Kumalae, Alfred G., 4,442,787, Cl. 114-363.000.

Kumata, Kiyoshi, to Sharp Kabushiki Kaisha. Electronic timepiece with melody alarm faculties. 4,443,114, Cl. 368-73.000.

Kume, Makoto; and Mizuno, Toshiaki, to Nippon Sheet Glass Co., Ltd. Glass composition suitable for production of fibrous wollastonite, method for producing said wollastonite, and wollastonite obtained thereby. 4,443,550, Cl. 501-65.000.

Kunii, Kazuya: *See*—
Tsutsumi, Saburo; Dozono, Kichihiko; Matayoshi, Yutaka; and Kunii, Kazuya, 4,442,808, Cl. 123-279.000.

Kunsch, Robert, to Regie Nationale des Usines Renault. Process and apparatus for automatic and continuous measurement of the shearing resistance of green sand used in modern molding machines. 4,442,884, Cl. 164-456.000.

Kunz, Walter; Eckhart, Wolfgang; and Hubele, Adolf, to Ciba-Geigy Corporation. Fungicidal compounds. 4,443,618, Cl. 549-320.000.

Kupper, Willy. Spreader vehicle for solid and liquid thawing materials. 4,442,979, Cl. 239-656.000.

Kuraray Co., Ltd.: *See*—
Fusayama, Takeo; and Yamauchi, Junichi, 4,443,197, Cl. 433-217.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Sakagami, Teruo; Arakawa, Noriyuki; and Murayama, Naohiro, 4,443,366, Cl. 260-112.00R.

Kurkela, Kauko O. A.: *See*—
Karjalainen, Arto J.; and Kurkela, Kauko O. A., 4,443,466, Cl. 424-274.000.

Kurland, Heinrich: *See*—
Schaper, Helmut; and Kurland, Heinrich, 4,443,266, Cl. 127-19.000.

Kuroiwa, Hiroshi: *See*—
Kashiwaya, Mineo; Nakagawa, Tohru; Yamada, Kinsaku; Kamifuji, Hiroshi; Oyama, Yoshishige; Kuroiwa, Hiroshi; and Tsuruta, Hisato, 4,442,818, Cl. 123-494.000.

Kurooka, Shigeru: *See*—
Sunahara, Noriyuki; Naruto, Shunsuke; Kagemoto, Akira; Kurooka, Shigeru; and Yokogawa, Kanae, 4,443,365, Cl. 260-112.00R.

Kurtis, Soma: *See*—
Wilensky, Joseph, 4,442,675, Cl. 60-654.000.

Kurtz, Anthony D.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Compensation and normalization apparatus for shear piezoresistive gage sensors. 4,442,717, Cl. 73-766.000.

Kurtz, Anthony D.: *See*—
Mallon, Joseph R.; and Kurtz, Anthony D., 4,443,293, Cl. 156-647.000.

Kurz, Craven H. Thermoplastic orthodontic arch wire retaining annular ligature and process. 4,443,190, Cl. 433-15.000.

Kushner, Burton A.; and Jirinec, Michael J., to Eutectic Corporation. Coating alloy. 4,443,521, Cl. 428-679.000.

Kuwabara, Hideki: *See*—
Akiyama, Hiroyuki; Kuwabara, Hideki; Yamaguchi, Toru; and Kishida, Masahiko, 4,443,393, Cl. 264-53.000.

Kuwata, Masayoshi, to General Electric Company. Fluidized particle tray heat exchanger. 4,442,888, Cl. 165-104.160.

Kyoto University: *See*—
Takagi, Toshinori; and Matsubara, Kakuei, 4,443,650, Cl. 136-211.000.

L. R. Nelson Corporation, Inc.: *See*—
Hayes, Jerry R., 4,443,028, Cl. 285-38.000.

L. Sauvageau & Cie: *See*—
Bleys, Christian, 4,443,003, Cl. 266-48.000.
Labarre, Ernest D.: *See*—
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 4,442,603, Cl. 30-249.000.
Laboratoires Jacques Logeais: *See*—
Maillard, J. Georges; and Legeai, Jacky, 4,443,468, Cl. 424-274.000.
LaBudde, Edward V.: *See*—
Hazel, Robert L.; and LaBudde, Edward V., 4,443,870, Cl. 369-44.000.
Lachmann, Ulrich: *See*—
Ertl, Wilhelm; Lachmann, Ulrich; and Pertsch, Heinrich, 4,443,275, Cl. 148-31.550.
Lackwerke Wulfing GmbH & Co.: *See*—
Schroder, Manfred; and Subramanyam, Arty R. T., 4,443,569, Cl. 523-414.000.
Lagakos, Nicholas: *See*—
Macedo, Pedro B.; Litovitz, Theodore A.; Lagakos, Nicholas; Mohr, Robert K.; and Meister, Robert, 4,443,700, Cl. 250-227.000.
Lagus, Peter L.; and Peterson, Edward W., to S-Cubed. Method of hydrofracture in underground formations. 4,442,895, Cl. 166-250.000.
LaHann, Thomas R.: *See*—
Buckwalter, Brian L.; and LaHann, Thomas R., 4,443,473, Cl. 424-300.000.
Laitem, Leopold: *See*—
Broze, Guy; and Laitem, Leopold, 4,443,352, Cl. 252-94.000.
Laitram Corporation, The: *See*—
Fowler, John T., 4,443,795, Cl. 340-870.310.
Lapeyre, James M., 4,443,708, Cl. 290-53.000.
Lakhani, Kishor M.; and Ligon, Jerry L., to Honeywell Information Systems Inc. Wear resistant electrode head for electrographic printers. 4,443,292, Cl. 156-634.000.
LaMattina, John L.; and Weeks, Paul D., to Pfizer Inc. p-Nitrophenyl 3-bromo-2,2-diethoxy-propionate and synthetic utility therefor. 4,443,621, Cl. 560-142.000.
Lamort, Jean P., to E et M Lamort (Societe Anonyme). Processes and devices for the disintegration of cellulose materials. 4,443,296, Cl. 162-52.000.
Landoussy, Claude: *See*—
Arretz, Emmanuel; Landoussy, Claude; Mirassou, Alfred; and Ollivier, Jean, 4,443,310, Cl. 204-158.00R.
Lang, Elliot R.; and Tobolski, Edward L., to Page-Wilson Corporation. Clamping nosepiece for hardness tester. 4,442,705, Cl. 73-83.000.
Lang, Franz J. Multiple story tower. 4,442,778, Cl. 108-111.000.
Lang, Theodore B.: *See*—
Bolick, Martha E.; Weber, Rebecca J.; and Lang, Theodore B., 4,442,552, Cl. 2-49.00R.
Langer, Robert S., Jr.; Linhardt, Robert; Cooney, Charles L.; and Galliher, Parrish M., to Massachusetts Institute of Technology. Process for producing heparinase. 4,443,545, Cl. 435-232.000.
Lansing Bagnall Limited: *See*—
Gibbons, Ralph D., 4,442,872, Cl. 140-92.100.
Lapeyre, James M., to Laitram Corporation, The. Apparatus for storing the energy of ocean waves. 4,443,708, Cl. 290-53.000.
Larkey, John T.: *See*—
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,297, Cl. 162-101.000.
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.
Larwood, Laurie G. Psychic connection game. 4,443,010, Cl. 273-242.000.
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., to Research Corporation. Platelet aggregation inhibitory agents and intermediates therefor. 4,443,450, Cl. 424-250.000.
Latsch, Reinhard; Schlembach, Hans; and Scherenberg, Dieter, to Robert Bosch GmbH. Method for igniting lean fuel-air mixtures and an apparatus to perform the method. 4,442,807, Cl. 123-263.000.
Laub, Herman. Fuel system for vehicles. 4,443,385, Cl. 261-18.00A.
Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, to USM Corporation. Shoe lasting machine. 4,442,563, Cl. 12-145.000.
Laurent, Daniel M.; and Theze, Claude, to Jeumont-Schneider Corporation. Information transmission device through the rails between a railway track and a vehicle assembly circulating on this track. 4,442,988, Cl. 246-34.0CT.
Laurie, Alexander S.: *See*—
Adams, James E.; and Laurie, Alexander S., 4,442,627, Cl. 47-56.000.
Laurizio, Jeremiah J.: *See*—
Dwinell, Davis B.; and Laurizio, Jeremiah J., 4,442,949, Cl. 220-257.000.
Laxo, Darryl E., to Chevron Research Company. Tubular clamp assembly. 4,443,029, Cl. 285-93.000.
Layton, James E., to Phillips Petroleum Company. Waveform generator. 4,443,713, Cl. 307-260.000.
Le Blanc, Joseph R., Jr.; Moore, Dewey O.; and Schneider, Robert V., III, to M. W. Kellogg Company, The. Adiabatically reforming a reformed gas for producing methanol. 4,443,560, Cl. 518-703.000.
Lee, Emerson H.: *See*—
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,443,642, Cl. 585-428.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,443,641, Cl. 585-428.000.
Lee, Leonard S.: *See*—
Sopp, Samuel W.; Lee, Leonard S.; and Howe, Michael W., 4,443,425, Cl. 423-635.000.
Lee, Richard J., to Standard Oil Company (Indiana). 1,4,Bis-N,N'-dipolyalkylquinonyl aminopropyl piperazine. 4,443,604, Cl. 544-399.000.
LeFrois, Richard T., to Honeywell Inc. Variable firing rate oil burner using aeration throttling. 4,443,180, Cl. 431-4.000.
Legeai, Jacky: *See*—
Maillard, J. Georges; and Legeai, Jacky, 4,443,468, Cl. 424-274.000.
Legrand, Michel; Canonne, Paul; and Brault, Christian, to Gerin, Merlin. Low voltage circuit breaker. 4,443,828, Cl. 361-93.000.
Legrand, Paul J.; and Hersen, Rene M. J., to Societe Nationale d'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.". Guidance device for the moving fairing of a thrust reverser system. 4,442,987, Cl. 244-110.00B.
Leikam, Gary E.: *See*—
Busch, Dennis G.; Grafe, Robert J.; and Leikam, Gary E., 4,443,863, Cl. 364-900.000.
Leimbach, J. George: *See*—
Barbier, William J.; and Leimbach, J. George, 4,442,680, Cl. 62-217.000.
Leistner, Herbert E. Nail feed mechanism. 4,442,965, Cl. 227-136.000.
Leland, David L.: *See*—
Kotick, Michael P.; and Leland, David L., 4,443,605, Cl. 546-39.000.
Leland, John E.: *See*—
Needham, Donald G.; and Leland, John E., 4,443,571, Cl. 524-90.000.
Lenk, Pedro A.: *See*—
Ellis, Thomas E.; Lenk, Pedro A.; and Shah, Jayantkumar R., 4,443,663, Cl. 179-18.0ES.
Lentz, Wallace D.: *See*—
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Leonard, John J.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,644, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,645, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,646, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,647, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,648, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,649, Cl. 585-500.000.
Le Scoul, Thierry: *See*—
Hicter, Jean-Marie; Le Scoul, Thierry; and Mairet, Serge, 4,443,004, Cl. 266-226.000.
Leslie, Stewart T.: *See*—
Oshlack, Benjamin; and Leslie, Stewart T., 4,443,428, Cl. 424-22.000.
Lester, Albert B.: *See*—
Pflanz, Herbert M.; and Lester, Albert B., 4,443,854, Cl. 364-483.000.
Lestina, Gregory J., to Eastman Kodak Company. Nondiffusible photographic couplers and photographic elements and processes employing same. 4,443,536, Cl. 430-552.000.
Levens, Dennis L. Cradle for stowing cylindrical tank. 4,442,991, Cl. 248-146.000.
Lever Brothers Company: *See*—
Darling, Donald F., 4,443,487, Cl. 426-603.000.
Levitt, George, to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,443,244, Cl. 71-93.000.
Levitt, Malcolm H., to National Research Development Corporation. NMR Spectroscopy. 4,443,761, Cl. 324-311.000.
Levy, Richard C.; and McCoy, Bryan. Drinking vessel. 4,442,948, Cl. 220-90.200.
Lewis, John O. Method for recovering solvent. 4,443,344, Cl. 210-774.000.
Liao, Hsiang P.: *See*—
Finley, Joseph H.; and Liao, Hsiang P., 4,443,384, Cl. 260-982.000.
Licentia Patent-Verwaltungs-GmbH: *See*—
Geissler, Klaus H.; and Hubner, Karl-Heinz, 4,443,840, Cl. 363-24.000.
Hammerling, Heinz; and Schairer, Werner, 4,443,786, Cl. 340-310.00R.
Rall, Bernhard; Burkhart, Johann; and Schluter, Klaus, 4,443,773, Cl. 333-104.000.
Lichtin, Norman N.; and Berman, Elliot, to Atlantic Richfield Company. Method for making amino acids. 4,443,311, Cl. 204-158.00R.
Lien, Eric L., to American Home Products Corporation. Antiulcer agent. 4,443,434, Cl. 424-177.000.
Lightbody, James D.; and Lightbody, William S. Apparatus and method for testing circuit boards. 4,443,756, Cl. 324-73.0PC.
Lightbody, William S.: *See*—
Lightbody, James D.; and Lightbody, William S., 4,443,756, Cl. 324-73.0PC.
Lignes Telegraphiques et Telephoniques: *See*—
Hulin, Jean-Pierre; DuBois, Gilles; and Paumier, Marcel, 4,442,575, Cl. 29-33.500.
Ligon, Jerry L.: *See*—
Lakhani, Kishor M.; and Ligon, Jerry L., 4,443,292, Cl. 156-634.000.

Lilley, Frank; and Rankin, Clarence S., deceased (by Rankin, Susan L., executrix), to Lurgi Corporation. Feed distributor for multiple hearth furnace. 4,442,782, Cl. 110-225.000.

Limehouse, William L.; and Miller, Thomas A. Device for preparing a bunch of produce for shipment, display and sale. 4,442,765, Cl. 100-6.000.

Lin, Kin-Yuan. Automatic recording, indicating and predicting device for gynecophysiological cycles. 4,443,851, Cl. 364-415.000.

Linde Aktiengesellschaft: *See—*
Miller, Michael A.; and Johansen, Richard P., 4,443,341, Cl. 210-702.000.

Lindgren, Douglas L.: *See—*
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,297, Cl. 162-101.000.
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.

Lindner, Robert L.; and Marshall, Luther. Wall assembly. 4,442,642, Cl. 52-98.000.

Lindsay, Gordon C.: *See—*
Foo, George; Grodkiewicz, Raymond W.; Kubis, Stanley E.; and Lindsay, Gordon C., 4,442,582, Cl. 29-403.300.

Lindsey, Stanley D.; Ioannides, Socrates A.; Horner, Jack R.; Denton, William S.; Shell, Donald P.; and Bebb, Hubert. Building structure method. 4,442,639, Cl. 52-73.000.

Linhardt, Robert: *See—*
Langer, Robert S., Jr.; Linhardt, Robert; Cooney, Charles L.; and Galliher, Parrish M., 4,443,545, Cl. 435-232.000.

Linman, Dale L.; and Bartz, Stephen A., to Lucht Engineering Corporation. Photographic printing system. 4,443,099, Cl. 355-75.000.

Linney, Edward A., legal representative: *See—*
Stageberg, Sterling O., deceased; and Linney, Edward A., legal representative, 4,443,167, Cl. 418-91.000.

Linse, Heinrich, to Siemens Aktiengesellschaft. Electrical component member which is mounted in a housing centered and adjusted. 4,443,656, Cl. 174-52.0PE.

Linzberger, Robert: *See—*
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Lionetti, Thomas A.; and MacLean, John P., to Texaco Inc. Method and new distributor for delivering high velocity gas from a gas distributor through a nozzle with decreased erosion in the nozzle. 4,443,551, Cl. 502-41.000.

Lipowski, Stanley A., to Diamond Shamrock Chemicals Company. Aluminum salts of aromatic sulfonic acids formaldehyde condensates. 4,443,382, Cl. 260-448.00R.

Lipp, Steven A., to RCA Corporation. Method of making a focusing color-selection structure for a CRT. 4,443,499, Cl. 427-258.000.

Lippitt, David L.: *See—*
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List, Hans: *See—*
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Marsoner, Hermann, 4,443,763, Cl. 324-439.000.

Liston, Thomas V.: *See—*
Yamaguchi, Elaine S.; and Liston, Thomas V., 4,443,360, Cl. 252-46.700.

Litovitz, Theodore A.: *See—*
Macedo, Pedro B.; Litovitz, Theodore A.; Lagakos, Nicholas; Mohr, Robert K.; and Meister, Robert, 4,443,700, Cl. 250-227.000.

Little, Roger G.; Wolfson, Robert G.; and Solomon, Stanley J., to Spire Corporation. Plasma ion deposition process. 4,443,488, Cl. 427-38.000.

Litton Industrial Products, Inc.: *See—*
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Litton Resources Systems, Inc.: *See—*
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Litton Systems, Inc.: *See—*
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Lochner, Karl-Heinz: *See—*
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Lodewick, Rainer: *See—*
Biard, Daniel; and Lodewick, Rainer, 4,443,270, Cl. 134-25.200.

Loeffler, Earl F.; Barrickman, Stephen R.; and Johnsen, John A., to Firestone Tire & Rubber Company, The. Work station. 4,443,290, Cl. 156-396.000.

Logsdon, Duane D. Pipe hanger capable of totally encircling a pipe. 4,442,994, Cl. 248-547.000.

Lomen, Pavel L., to Upjohn Company, The. Treatment of adult respiratory distress syndrome. 4,443,476, Cl. 424-317.000.

Long, Ralph W.; Smith, Charles B.; and Baer, Don E. Striping apparatus for marking surfaces. 4,442,975, Cl. 239-150.000.

Longfield, Warren E.: *See—*
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Lonza Ltd.: *See—*
Tenud, Leander; and Blum, Rene, 4,443,627, Cl. 564-136.000.

Lord, C. Dennis. Ultrasonic cleaner apparatus. 4,442,852, Cl. 134-135.000.

Loubiere, David L. Trailer wheel adaptable to automobile hubs. 4,443,039, Cl. 301-64.0SD.

Loukonen, Ernest W. Sliding separator for pulsating lines. 4,442,866, Cl. 138-31.000.

Lovalenti, Sam: *See—*
Dorf, Arthur L.; Lovalenti, Sam; Pezzin, John J.; and Riggs, Darius O., 4,442,934, Cl. 198-344.000.

Lovgren, Eric M.: *See—*
Schmidt, Lawrence R.; and Lovgren, Eric M., 4,443,591, Cl. 528-128.000.
Schmidt, Lawrence R.; Lovgren, Eric M.; and Meissner, Peter G., 4,443,592, Cl. 528-128.000.

Lubrizol Corporation, The: *See—*
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Lucas Industries: *See—*
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Lucas Industries Limited: *See—*
Harrison, Anthony W., 4,443,026, Cl. 280-714.000.

Lucas Industries Public Limited Company: *See—*
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Lucht Engineering Corporation: *See—*
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Luder, Rainer; and Haussmann, Wolfgang, to Siemens Aktiengesellschaft. CTD Transversal filter. 4,443,774, Cl. 333-165.000.

Ludw. Lindgens KG Lederfabrik: *See—*
Muntjes, Wolfgang, 4,442,687, Cl. 69-1.000.

Luedtke, Paul A.: *See—*
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Lukens General Industries, Inc.: *See—*
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Lummus Company, The: *See—*
Gelbein, Abraham P.; and Nislick, Arthur S., 4,443,620, Cl. 549-521.000.

Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, to Chevron Research Company. 1-Alkyl derivatives of 3-aryloxy-4-(2-carbalkoxy)-phenyl-azet-2-ones as plant growth regulators. 4,443,372, Cl. 260-239.00A.

Lurgi Corporation: *See—*
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Lutner, John D.: *See—*
Shihabi, David S.; and Lutner, John D., 4,443,327, Cl. 208-97.000.

Lutz, Eugene F., to Shell Oil Company. Method of removing hydrogen sulfide and carbon dioxide from gases. 4,443,418, Cl. 423-226.000.

Lux, Richard A., to Xerox Corporation. Compact development system. 4,443,102, Cl. 355-3.0DD.

Lynn, Alan W., to Lynn, Alan W. Stuffed shrimp preparation tool. 4,442,570, Cl. 17-73.000.

Lyu, Seung W., to National Can Corporation. Tandem ironing land assembly. 4,442,692, Cl. 72-349.000.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See—*
Gunther, Siegfried; and Winterholler, Cohann, 4,442,611, Cl. 34-41.000.

M. W. Kellogg Company, The: *See—*
Le Blanc, Joseph R., Jr.; Moore, Dewey O.; and Schneider, Robert V., III, 4,443,560, Cl. 518-703.000.

MacCarthy, Patrick. Tape-supported sleeper yo-yo. 4,442,625, Cl. 46-61.000.

MacDonald, Christopher; and Crow, Vesta J. Tamper resistant closure apparatus. 4,442,946, Cl. 215-230.000.

Macedo, Pedro B.; Litovitz, Theodore A.; Lagakos, Nicholas; Mohr, Robert K.; and Meister, Robert, to Macedo, Pedro B.; and Litovitz, Theodore A. Optical sensing apparatus and method. 4,443,700, Cl. 250-227.000.

Macfarlane, John L.: *See—*
Ballard, Jack V., Jr., 4,442,874, Cl. 141-166.000.

Maciag, Thomas: *See—*
Stemerman, Michael B.; Weinstein, Robert; and Maciag, Thomas, 4,443,546, Cl. 435-240.000.

Maciolek, Joseph R.; and Diamond, Edmond D., to United Technologies Corporation. Optical digital servo control system. 4,443,853, Cl. 364-434.000.

MacIsaac, Bernard D., to Aviation Electric Ltd. Acceleration limit reset. 4,442,667, Cl. 60-39.281.

MacLean, John P.: *See—*
Lionetti, Thomas A.; and MacLean, John P., 4,443,551, Cl. 502-41.000.

Maertens, Gregory E. Floating marker. 4,443,203, Cl. 441-22.000.

Magnaflux Corporation: *See—*
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Magorien, Vincent G., to Systron Donner Corp. Fluid line coupling device. 4,442,863, Cl. 137-614.030.

Mahurkar, Sakharam D. Portable dialysis system and pump therefor. 4,443,333, Cl. 210-87.000.

Maikowski, Michael: *See—*
Dietz, Erwin; Maikowski, Michael; and Gutbrod, Robert, 4,443,263, Cl. 106-287.240.

Maillard, J. Georges; and Legeai, Jacky, to Laboratoires Jacques Logeais. Benzofuran derivatives, process for their preparation and their therapeutic applications. 4,443,468, Cl. 424-274.000.

Maillefer, Eric: *See—*
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Maimone, Adriano: *See—*
Pansolli, Paolo; Barbaro, Aurelio; Maimone, Adriano; and Valdiserri, Mario, 4,443,267, Cl. 127-46.200.

Mairet, Serge: *See*—
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Makovic, Dorothy I.: *See*—
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Makovic, Edward M.; and Makovic, Dorothy I. Combination card and dice game. 4,443,012, Cl. 273-292.000.
Mallik, Arjun; and Edelstein, Harold, to Allied Corporation. Liquid scintillation composition for low volume biological specimens. 4,443,356, Cl. 252-301.170.
Mallon, Joseph R.; and Kurtz, Anthony D., to Kulite Semiconductor Products, Inc. Method of fabricating transducer structure employing vertically walled diaphragms with quasi rectangular active areas. 4,443,293, Cl. 156-647.000.
Mallon, Joseph R.: *See*—
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Maloney, James E.; and Oakes, Thomas R., to Economics Laboratory, Inc. Hydrophobic silica or silicate, compositions containing the same and methods for making and using the same. 4,443,357, Cl. 252-321.000.
Malueg, Richard M.: *See*—
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Mandigo, Frank N.: *See*—
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Mannesmann-Rexroth GmbH: *See*—
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Mansberger, Robert L., II, to AMP Incorporated. Molding apparatus including insert feeding means. 4,443,173, Cl. 425-126.00R.
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Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.
Marini, Jean; and Gravelle, Alain, to Framatome. Method and apparatus for detecting defective fuel elements in a nuclear reactor fuel assembly. 4,443,402, Cl. 376-252.000.
Marion, Bernard, to Society dite: sophysa. Valve for the treatment of hydrocephalus. 4,443,214, Cl. 604-9.000.
Marion, Richard A.: *See*—
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Markau, Dieter, to Gimelli + Co. AG. Mouth douche. 4,442,830, Cl. 128-66.000.
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Marsoner, Hermann, to List, Hans. Method and an apparatus for checking polarographic measuring electrodes. 4,443,763, Cl. 324-439.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Process for the preparation of derivatives of 6,6-dimethyl-4-hydroxy-3-oxabicyclo-[3,1,0]-hexan-2-one. 4,443,617, Cl. 549-302.000.
Martin, Samuel A.; Bakker, Fredrick J.; Hungerink, Gerald W.; Gisinger, Jack L.; and Bush, James H., to Holland Hitch Company. Fifth wheel assembly. 4,443,025, Cl. 280-407.000.
Martinelli, Lawrence G.; and Garrison, Mark R., to Verbatim Corporation. Forming process for light gauge polymer sheet material. 4,443,398, Cl. 264-235.000.
Martins, Joseph G.; Donermeyer, Donald D.; and Fabel, David A., to Monsanto Company. Bonded reinforced plastic structures. 4,443,518, Cl. 428-336.000.
Martins, Joseph G.: *See*—
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Matsui, Takahiro, to Kabushiki Kaisha Morita Seisakusho. Driving and water pouring control device for dental air-turbine handpiece. 4,443,195, Cl. 433-84.000.
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Matsuoka, Kazuhiko; and Minoura, Kazuo, to Canon Kabushiki Kaisha. Scanning optical system having a tilting correcting function. 4,443,055, Cl. 350-6.500.
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Matsushita Electric Industrial Co., Ltd.: *See*—
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Maurer, Donald D.; Swift, David E.; and Ioffe, Zosim, to EMPI, Inc. Method of modulating energy in train of electrical pulses. 4,442,839, Cl. 128-419.00R.
May, Max; Monsheimer, Rolf; and Pfleiderer, Ernst, to Rohm GmbH. Tanning method. 4,443,221, Cl. 8-94.160.
May, Roger C.; and Sessa, Frank C., to Betz Laboratories, Inc. Control of iron induced fouling in water systems. 4,443,340, Cl. 210-697.000.
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McCabe, Francis J. Link bar operator for rotating blade dampers. 4,442,862, Cl. 137-601.000.

McCarley, Roy J. Cartridge extraction tool. 4,442,619, Cl. 42-1.00R.

McCombie, Stuart W., to Schering Corporation. (5R,6S,8R)-6-(1-Hydroxyethyl)-2-(hydroxyalkylthio)-penem-3-carboxylates. 4,443,463, Cl. 424-270.000.

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McElroy, David J., to Texas Instruments Incorporated. Memory system for microprocessor with multiplexed address/data bus. 4,443,864, Cl. 364-900.000.

McGehee, Fred N., Sr.; Peck, Billy J.; Betz, Clyde B.; and Morgan, Calvin R., Jr. Method of construction for thermal and acoustic insulation blankets. 4,442,585, Cl. 29-432.000.

McGlinchey, Gerard F., to Advanced Micro Devices, Inc. Second order temperature compensated band cap voltage reference. 4,443,753, Cl. 323-313.000.

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McLaughlin, William A., to Shell Oil Company. Removal of color bodies in bisphenol production. 4,443,635, Cl. 568-728.000.

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McNeely, Maurice G.; and Gomes, Rodney A. Multiple company credit card system. 4,443,027, Cl. 283-83.000.

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Meinecke, Dieter; Schmidt, Werner; Schussler, Rudolf; and van Rijckevorsel, Rainer, to Clinicon Mannheim GmbH. Blood lancet device. 4,442,836, Cl. 128-314.000.

Meinhold, Henner; and Hasenauer, Dieter, to Brown, Boveri & Cie AG. High-temperature battery. 4,443,524, Cl. 429-99.000.

Meisch, Charles E.; and Keating, David M., to C. R. Bard, Inc. System for aseptically draining a urine bag. 4,443,219, Cl. 604-317.000.

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Meitner, Gary H.; and Notheis, Patrick J., to Kimberly-Clark Corporation. Soft thermoplastic fiber webs and method of making. 4,443,513, Cl. 422-195.000.

Melchior, Bernd, to August Hohnholz KG; Imchemie Kunststoff GmbH; and Melchior, Bernd. Process of making articles of foamed polymethyl methacrylate. 4,443,391, Cl. 264-22.000.

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Merz, Johann, to Zahnradfabrik Friedrichshafen, AG. Gear pump. 4,443,169, Cl. 418-171.000.

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Meyer, Kurt; Reh, Lothar; Hirsch, Martin; Schnabel, Wolfram; and Serbent, Harry, to Metallgesellschaft Aktiengesellschaft. Process of producing sponge iron by a direct reduction of iron oxide-containing materials. 4,443,250, Cl. 75-26.000.

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Meyer, Willy; and Fory, Werner, to Ciba-Geigy Corporation. N-Phenylsulfonyl-N'-triazinylureas. 4,443,245, Cl. 71-93.000.

Meyer, Willy: *See*—
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Mihara, Shin-ichi, to Olympus Optical Co., Ltd. Compact camera lens system with a short overall length. 4,443,069, Cl. 350-469.000.

Mikami, Wataru; Nagatake, Kazuo; and Ono, Takuo. Neutral-point-clamped PWM inverter. 4,443,841, Cl. 363-41.000.

Mikami, Yoshiharu, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus. 4,442,910, Cl. 177-25.000.

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Minter, Thomas F.; Jansen, Lawrence G.; and Springford, Richard H., to Goodyear Tire & Rubber Company, The. Decorative ornamentation for a rubber article and method for making same. 4,442,618, Cl. 40-587.000.
Mintz, Michael D., to International Technidyne, Inc. Apparatus for analyzing the influence of additive reagents upon the coagulation of blood. 4,443,408, Cl. 422-73.000.
Miranti, Joseph P., Jr., to Dayco Corporation. Method of making an arched endless belt. 4,443,281, Cl. 156-140.000.
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Yamada, Shoji; Kanada, Eiji; and Mathubara, Eiji, 4,443,531, Cl. 430-204.000.
Mitsubishi Petrochemical Co., Ltd.: *See*—
Kitamura, Mitsuaki; Nakayama, Toshio; Kamimura, Kunio; Seo, Iwao; and Yaguchi, Tomonobu, 4,443,730, Cl. 310-330.000.
Mitsubishi Rayon Company Limited: *See*—
Uehara, Masaru; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,442,841, Cl. 128-635.000.
Mitsudomi, Hiroyuki: *See*—
Shimizu, Shoji; and Mitsudomi, Hiroyuki, 4,443,183, Cl. 431-354.000.
Mitsui Coke Co., Ltd.: *See*—
Sakurai, Masao; and Wada, Tetsuo, 4,443,328, Cl. 208-106.000.
Mitter, Mathias. Apparatus for applying a foamed treating medium to a workpiece. 4,442,771, Cl. 101-122.000.
Mitutoyo Mfg. Co., Ltd.: *See*—
Itabashi, Tatsuo, 4,443,076, Cl. 353-101.000.
Sakata, Hideo; and Saito, Masami, 4,442,607, Cl. 33-1.00M.
Mixich, Georg; and Thiele, Kurt, to Siegfried Aktiengesellschaft. Process for the stereospecific preparation of imidazolyl oximes. 4,443,612, Cl. 548-341.000.
Miyagi, Hideo: *See*—
Nagase, Masaomi; Miyagi, Hideo; Ono, Hironobu; and Nakano, Jiro, 4,442,813, Cl. 123-418.000.
Miyakawa, Hideaki; Takahashi, Yasuki; and Hata, Fumio, to Canon Kabushiki Kaisha. Electromagnetic transmitting apparatus for a camera. 4,443,090, Cl. 354-289.120.
Miyake, Hajimu: *See*—
Muryobayashi, Takashi; Miyake, Hajimu; and Yamato, Takashi, 4,443,478, Cl. 424-331.000.
Miyake, Hidekazu: *See*—
Senda, Shigeo; Ohtani, Osamu; Katho, Eiichi; Nagasaka, Mitsuaki; Miyake, Hidekazu; Fujiwara, Khosuke; and Tanaka, Motoaki, 4,443,607, Cl. 546-141.000.
Miyake, Makoto: *See*—
Kondo, Mitsuru; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,443,614, Cl. 548-469.000.
Miyamoto, Yoshikazu; Kakimoto, Tetsuya; and Tanida, Wasaburo, to Tokico Ltd. Apparatus for supplying fluid of preset quantity. 4,442,953, Cl. 222-14.000.
Miyoshi, Hajime; Asanagi, Etsuo; Iguchi, Junsuke; and Okabayashi, Ikuo, to Chiyoda Chemical Engineering & Constr., Co., Ltd. Method for strengthening soft soil. 4,443,260, Cl. 106-109.000.
Mizuno, Toshiaki; and Takao, Mitsunori, to Nippondenso Co., Ltd. Method and apparatus for controlling internal combustion engines. 4,442,812, Cl. 123-417.000.
Mizuno, Toshiaki: *See*—
Kume, Makoto; and Mizuno, Toshiaki, 4,443,550, Cl. 501-65.000.
Mobil Oil Corporation: *See*—
Chen, Nai Y.; and Rankel, Lillian A., 4,443,325, Cl. 208-55.000.
Dessau, Ralph M., 4,443,554, Cl. 502-71.000.
Herrington, F. John, 4,443,400, Cl. 264-519.000.
Holden, M. James, 4,442,969, Cl. 229-2.50R.
Padilla, Joseph R.; Richardson, Emmett M.; and Chatas, Angelos T., 4,442,900, Cl. 166-342.000.
Shihabi, David S.; and Lutner, John D., 4,443,327, Cl. 208-97.000.
Tobias, Michael A., 4,443,589, Cl. 527-300.000.
Mobil Solar Energy Corporation: *See*—
Kalejs, Juris P., 4,443,411, Cl. 422-246.000.
Mobile Pulley & Machine Works (A division of Lehigh Valley Industries, Inc.): *See*—
Hairston, Hannon S.; and Hanrath, M. E., 4,443,030, Cl. 285-263.000.
Mochizuki, Tomiyuki. Apparatus for manufacture of paper tube. 4,443,212, Cl. 493-289.000.
Mod-Lok Industries, Ltd.: *See*—
Jukes, Christoher E., 4,442,644, Cl. 52-213.000.
Modur, Bhaskar S.; Perl, Uwe W.; and Smick, Donald E., to Ford Motor Company. Back flush injection nozzle. 4,443,177, Cl. 425-543.000.
Moertel, George B., to Talon, Inc. Shearing slide fastener chain. 4,442,583, Cl. 29-408.000.
Mohr, Robert K.: *See*—
Macedo, Pedro B.; Litovitz, Theodore A.; Lagakos, Nicholas; Mohr, Robert K.; and Meister, Robert, 4,443,700, Cl. 250-227.000.
Moinard, Philippe: *See*—
Armand, Marcel; and Moinard, Philippe, 4,443,306, Cl. 204-64.00T.
Moist, Stanford C., Jr., to AMP Incorporated. Assembly with verification feature. 4,443,048, Cl. 339-63.00M.
Molecular Genetics, Inc.: *See*—
Sadowski, Peter L., 4,443,549, Cl. 436-548.000.
Molina, Orlando G., to Rockwell International Corporation. Method for nondestructive magnetic inspection and rubber-like magnetic recording medium employed therein. 4,443,350, Cl. 252-62.540.
Moll, Robert, to Etablissement Liotte Rep. Etrangenes. Fishing reel with adjustable drum brake. 4,442,983, Cl. 242-84.51R.
Moller, Gunther: *See*—
Buchholz, Albert; Hesse, Werner; and Moller, Gunther, 4,443,021, Cl. 279-4.000.
Molls, Hans-Heinz: *See*—
Wolff, Joachim; Wolf, Karlheinz; Koll, Jochen; Hornle, Reinhold; Molls, Hans-Heinz; and Paulat, Volker, 4,443,225, Cl. 8-549.000.
Molnick, Melvin. Button puncher or crimper. 4,442,581, Cl. 29-243.500.
Monarch Marking Systems, Inc.: *See*—
Pou, Frederick M.; and Straub, Richard L., 4,442,774, Cl. 101-226.000.
Monforts, A.: *See*—
van Wersch, Kurt; and Pabst, Manfred, 4,442,560, Cl. 8-151.000.
Moniot, Jerome L.: *See*—
Cimarusti, Christopher M.; Fox, Rita T.; Fritz, Alan W.; Koster, William H.; and Moniot, Jerome L., 4,443,374, Cl. 260-245.400.
Monsanto Company: *See*—
Donermeyer, Donald D.; Martins, Joseph G.; and Fabel, David A., 4,443,519, Cl. 428-336.000.
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,443,642, Cl. 585-428.000.
Martins, Joseph G.; Donermeyer, Donald D.; and Fabel, David A., 4,443,518, Cl. 428-336.000.
Moran, Thomas M., 4,443,233, Cl. 55-97.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., 4,443,641, Cl. 585-428.000.
Weingarten, Harold I., 4,443,367, Cl. 260-112.50R.
Monsheimer, Rolf: *See*—
May, Max; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,443,221, Cl. 8-94.160.
Montalvo, Edwin J., Sr. Air actuated force intensifying piston and cylinder assembly for brakes and clutches. 4,442,930, Cl. 192-85.0AB.
Montalvo, Edwin J., Sr. Air actuated force intensifying piston and cylinder assembly for brakes and clutches. 4,442,931, Cl. 192-85.0AB.
Monteath, Don; and Wilson, Thomas B., Jr. Vehicle windshield protective curtain. 4,442,881, Cl. 160-25.000.

Moog Inc.: *See*—
Hoffman, Stanley J., Jr.; and Waffner, William D., 4,442,855, Cl. 137-83.000.

Moore, Dewey O.: *See*—
Le Blanc, Joseph R., Jr.; Moore, Dewey O.; and Schneider, Robert V., III, 4,443,560, Cl. 518-703.000.

Moore, Douglas R.: *See*—
Gross, Glenn; and Moore, Douglas R., 4,442,745, Cl. 84-1.010.

Moore, Sanders H.; and Smith, Maurice R., to Olin Corporation. Reduction of available chlorine in alkali brines. 4,443,307, Cl. 204-98.000.

Moran, Thomas M., to Monsanto Company. Mist separator. 4,443,233, Cl. 55-97.000.

Morgan, Calvin R., Jr.: *See*—
McGehee, Fred N., Sr.; Peck, Billy J.; Betz, Clyde B.; and Morgan, Calvin R., Jr., 4,442,585, Cl. 29-432.000.

Morgan, Charles R.; and Ketley, Arthur D., to W. R. Grace & Co. Heat curable conductive ink. 4,443,495, Cl. 427-96.000.

Morgan, Richard L.; and Pickett, David A., to Allied Corporation. Glow plug controller for diesel engines. 4,442,804, Cl. 123-145.00A.

Mori, Leo; Aoba, Takashi; and Tominaga, Mamoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Rear projection apparatus. 4,443,814, Cl. 358-60.000.

Moriguchi, Seki; Koizumi, Katsuo; and Nagayama, Sueji, to Hitachi Koki Compony, Limited. Hand-held power tool with a mechanism. 4,442,878, Cl. 145-4.000.

Morimoto, Hisashi: *See*—
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.

Morimoto, Masafumi: *See*—
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Morinaga, Kaoru: *See*—
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Morino, Toshiharu: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, 4,443,388, Cl. 261-39.00A.

Morioka, Akitoshi: *See*—
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Morita, Minoru: *See*—
Numano, Masachik; and Morita, Minoru, 4,442,577, Cl. 29-33.00T.

Morita, Misao: *See*—
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Moriyama, Satoru: *See*—
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Moriyama, Satoru; Chono, Tadashi; and Uchiyama, Tsugio, 4,443,439, Cl. 424-211.000.

Morris, Cletus E.; and Welch, Clark M., to United States of America, Agriculture. Zinc pyrithione process to impart antimicrobial properties to textiles. 4,443,222, Cl. 8-189.000.

Morris, Richard F.: *See*—
Hogan, Robert D., Jr.; Sanghvi, Narendra T.; and Morris, Richard F., 4,443,816, Cl. 358-160.000.

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Giacomelli, Renato, 4,443,074, Cl. 351-178.000.

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Moser, Kurt: *See*—
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Motoren- und Turbinen-Union Munich GmbH: *See*—
Merz, Herbert, 4,443,343, Cl. 210-768.000.

Motta, Valerio, to AGIP, S.p.A. Method for preparing thin sections for the microscopic study of small fragments of rock or dust, using a plate containing cells. 4,443,395, Cl. 264-117.000.

Mottin, Howard C.: *See*—
Pouri, Theodore H.; and Mottin, Howard C., 4,442,753, Cl. 89-46.000.

Mullaney, Dennis: *See*—
Gronbeck, Peter W.; Mullaney, Dennis; and Smith, Kimberly M., 4,442,920, Cl. 182-199.000.

Muller, Bernard L.: *See*—
Schulte-Elte, Karl H.; Muller, Bernard L.; and Maillefer, Eric, 4,443,632, Cl. 568-375.000.

Muller, Hans. Apparatus for combined cooling and aeration of biochemical-action vessels. 4,442,889, Cl. 165-109.00R.

Muller, Hans, to DrM, Dr. Mueller, AG. Method of cleaning filter elements. 4,443,346, Cl. 210-785.000.

Muller, Jean-Pierre: *See*—
Doremus, Bernard; and Muller, Jean-Pierre, 4,442,902, Cl. 166-374.000.

Muller, Jorg, to Siemens Aktiengesellschaft. Doppler radar. 4,443,796, Cl. 343-5.0PD.

Muller, Karl-Heinz: *See*—
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Muller, Kurt; and Wirz, Armin, to Rieter Machine Works, Ltd. Heatable godet and a method of heating a godet. 4,443,689, Cl. 219-469.000.

Muller, Peter: *See*—
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Musch, Rudiger; Pampus, Gottfried; Casper, Rudolf; Muller, Peter; and Gobel, Wilhelm, 4,443,583, Cl. 525-215.000.

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Mulloy, Joseph W.: *See*—
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Multifastener Corporation: *See*—
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Munson, Robert E.: *See*—
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Muntjes, Wolfgang, to Ludw. Lindgens KG Lederfabrik. Apparatus for the tentering of skins or hides in the manufacture of leather. 4,442,687, Cl. 69-1.000.

Murakami, Mayu: *See*—
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Murakami, Naotaka: *See*—
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Murakami, Ryoichi: *See*—
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Muramoto, Yutaka; Kobayashi, Susumu; and Ishizaka, Hideo, to Terumo Corporation. Measuring apparatus, method of manufacture thereof, and method of writing data into same. 4,443,117, Cl. 374-1.000.

Murano, Tamio; Yamane, Satoshi; Suzuki, Toshitatsu; and Fukushima, Yoshio, to Ricoh Company, Ltd. Current signal controlled camera system. 4,443,082, Cl. 354-145.100.

Murata Kikai Kabushiki Kaisha: *See*—
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Murata Manufacturing Co., Ltd.: *See*—
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Murata, Masayoshi: *See*—
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Murata, Moriyasu; Suzuki, Akira; Nakae, Atsuo; and Ito, Susumu, to Kao Corporation. Detergent composition. 4,443,355, Cl. 252-174.120.

Murayama, Naohiro: *See*—
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Murphy, James V., to Advanced Interconnections. Socket terminal positioning method and construction. 4,442,938, Cl. 206-329.000.

Murphy, Judith K. Toilet training device. 4,443,200, Cl. 434-247.000.

Muryobayashi, Takashi; Miyake, Hajimu; and Yamato, Takashi, to Ono Pharmaceutical Co., Ltd. Prostaglandin analogues. 4,443,478, Cl. 424-331.000.

Musch, Rudiger; Pampus, Gottfried; Muller, Peter; Eisele, Ulrich; Konter, Wolfgang; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Mixtures of chloroprene polymers and the production thereof. 4,443,582, Cl. 525-215.000.

Musch, Rudiger; Pampus, Gottfried; Casper, Rudolf; Muller, Peter; and Gobel, Wilhelm, to Bayer Aktiengesellschaft. Process for the production of chloroprene polymer mixtures. 4,443,583, Cl. 525-215.000.

Musgrave, Daniel D. Magazine hanger. 4,442,962, Cl. 224-255.000.

Musseau, Joel R.: *See*—
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Muto, Toshiaki, to Tokiko Kabushiki Kaisha. Simplified hydraulic damper. 4,442,926, Cl. 188-317.000.

Mutoh, Masayuki; Ishidoh, Takanobu; and Hayashi, Toshihiro, to Minolta Camera Kabushiki Kaisha. Process for preparing hectographic printing masters. 4,443,820, Cl. 358-296.000.

Nabu Manufacturing Corporation: *See*—
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Nagai, Nobuyuki: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.

Nagano, Takahiro: *See*—
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Nagasaka, Mitsuaki: *See*—
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Nagasawa, Kiyoto; and Yamada, Hiroshi, to Ricoh Company, Ltd. Exposure value control system for copying machines. 4,443,097, Cl. 355-68.000.

Nagase, Masaomi; Miyagi, Hideo; Ono, Hironobu; and Nakano, Jiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method of and apparatus for controlling the ignition timing of an internal combustion engine. 4,442,813, Cl. 123-418.000.

Nagata, Wataru: *See*—
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Nagatake, Kazuo: *See*—
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Nagatomo, Shigemi: *See*—
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Nagayama, Sueji: *See*—
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Nagpal, Krishen L., to Buffalo Color Corporation. Pharmaceutical N-phenyl carbamoyl glycinate compositions. 4,443,474, Cl. 424-309.000.

Nakae, Atsuo: *See*—
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Nakagawa, Akira: *See*—
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Nakai, Masaaki: *See*—
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Nakai, Meroji: *See*—
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Nakajima, Kaoru; Kobayashi, Kunio; and Hisagen, Yoshiaki, to Sony Corporation. Magnetic recording medium. 4,443,490, Cl. 427-44.000.

Nakajima, Takashi: *See*—
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Nakamura, Noriaki; Kishimoto, Tomio; and Yamamoto, Yuichi, to Matsushita Electric Industrial Co., Ltd. Rotary encoder contact disk. 4,443,670, Cl. 200-11.0DA.

Nakamura, Norihiko: *See*—
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Nakanishi, Tosaku: *See*—
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Nakano, Tomio; and Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor buffer circuit having compensation for power source fluctuation. 4,443,714, Cl. 307-269.000.

Nakano, Yoshiyuki, to Nippon Kogaku K.K. Driving apparatus in a camera. 4,443,083, Cl. 354-152.000.

Nakashima Seisakusho Co., Ltd.: *See*—
Shigeo, Nakashima, 4,442,865, Cl. 137-874.000.

Nakashima, Yoichi: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Nakashima, Yoichi; Tsuji, Masayoshi; Aoki, Tetsuo; and Ide, Hiroyuki, 4,443,626, Cl. 562-434.000.

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Nakatani, Nobuo: *See*—
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Nakayama, Shunsuke: *See*—
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Nakayama, Toshio: *See*—
Kitamura, Mitsuaki; Nakayama, Toshio; Kamimura, Kunio; Seo, Iwao; and Yaguchi, Tomonobu, 4,443,730, Cl. 310-330.000.

Nakazawa, Hiroshi; and Kuji, Makoto, to Toho Sheet Frame Co., Ltd. Hermetically sealed container. 4,442,951, Cl. 220-319.000.

Nakhla, Michael S., to Northern Telecom Limited. Filters comprising reactive components, and a method of determining impedances thereof. 4,443,662, Cl. 179-2.00C.

Nalco Chemical Company: *See*—
Bhattacharyya, Bhupati I.; Slovinsky, Manuel; Wachala, Raymond J.; Beske, Lawrence E.; and McCullar, Michael L., 4,443,576, Cl. 524-522.000.

Namikoshi, Hajime; Okumura, Yoshiaki; and Sei, Tsuyoshi, to Daicel Chemical Industries Ltd. Cellulose ester derivatives and a process for the production thereof. 4,443,595, Cl. 536-58.000.

Narozny, Ronald S., to Thomas & Betts Corporation. Method for making an electrical connector. 4,442,594, Cl. 29-884.000.

Naruo, Kyoichi: *See*—
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Nassau Recycle Corporation: *See*—
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Nasu, Sataroh; Iwanaga, Kouichi; and Kikuchi, Hiroshi, to Matsushita Electric Works, Ltd. Casing of a washable electric appliance. 4,442,596, Cl. 30-41.500.

Nath, Dilip K.: *See*—
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Nath, Prem: *See*—
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National Can Corporation: *See*—
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National Institute for Researches in Inorganic Materials: *See*—
Sato, Tadao; Ishii, Toshihiko; and Setaka, Nobuo, 4,443,420, Cl. 423-290.000.

National Instrument Company, Inc.: *See*—
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National Polymers Inc.: *See*—
Anderson, Dennis C., 4,442,629, Cl. 47-71.000.

National Research Development Corporation: *See*—
Levitt, Malcolm H., 4,443,761, Cl. 324-311.000.

National Service Industries, Inc.: *See*—
Wooley, Robert E., 4,443,211, Cl. 493-188.000.

Nationwide Carriers Incorporated: *See*—
Veach, B. R., 4,442,819, Cl. 123-557.000.

Navach, Joseph H. Method and apparatus for making physiological measurements. 4,442,844, Cl. 128-663.000.

NCR Corporation: *See*—
Kallin, Fredrik L. N., 4,442,769, Cl. 101-93.190.

Neal, Brian P.; and Turner, Alan R., to Bendix Westinghouse Limited. Fluid injector devices. 4,442,957, Cl. 222-207.000.

Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek: *See*—
Van Duin, Pieter J.; and Van Erkel, Joost, 4,443,309, Cl. 204-149.000.

Nederlandse Centrale Organistatie voor Toegepast Natuurwetenschappelijk Onderzoek: *See*—
den Otter, Johan L., 4,443,110, Cl. 366-97.000.

Needham, Donald G.; and Leland, John E., to Phillips Petroleum Company. Laser printable polyarylene sulfide compositions. 4,443,571, Cl. 524-90.000.

Neff, Steven W.: *See*—
Borsh, Richard J.; Neff, Steven W.; and Pate, Harold T., 4,443,031, Cl. 285-419.000.

Nehring, Arthur C. Hog finishing building. 4,442,792, Cl. 119-16.000.

Nemec, Joseph W.; and Cholod, Michael S., to Rohm and Haas Company. Preparation of methacrolein and methacrylonitrile from tert-butyl alkanoates. 4,443,383, Cl. 260-465.200.

New Way Packaging Machinery, Inc.: *See*—
Roth, William F.; and Snyder, Nevin, 4,443,285, Cl. 156-215.000.

Newman, Leon A.: *See*—
Chenausky, Peter P.; and Newman, Leon A., 4,443,877, Cl. 372-38.000.

Newman, William A., to Utah Research & Development Co., Inc. Solid state battery charger. 4,443,752, Cl. 320-22.000.

Ng, Ying-Wah, to Bell Telephone Laboratories, Incorporated. Fast parity generation for find low order zero circuit. 4,443,876, Cl. 371-49.000.

Nifco Inc.: *See*—
Kimura, Shigeru, 4,442,634, Cl. 49-493.000.

Nigara, Hideo: *See*—
Nirasawa, Masami; and Nigara, Hideo, 4,442,724, Cl. 74-10.410.

Nihon Velbon Seiki Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Toshiharu; and Nakatani, Koichiro, 4,443,128, Cl. 403-385.000.

Nilsson, Lars-Erik: *See*—
Norder, Stig; and Nilsson, Lars-Erik, 4,442,854, Cl. 137-82.000.

Ninomiya, Masakazu, to Nippondenso Co., Ltd. Optimum air-fuel ratio control for internal combustion engine. 4,442,815, Cl. 123-436.000.

Nippon Electric Co., Ltd.: *See*—
Kubo, Hiroshi, 4,443,661, Cl. 179-2.0EB.
Ohwada, Hiroyuki, 4,443,849, Cl. 364-200.000.

Nippon Engineer Service Kabushiki Kaisha: *See*—
Sawada, Koji, 4,442,702, Cl. 73-49.200.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Kaneko, Makoto; and Okumura, Takatoshi, 4,442,748, Cl. 84-1.010.

Nippon Kogaku K.K.: *See*—
Nakano, Yoshiyuki, 4,443,083, Cl. 354-152.000.
Saegusa, Takashi, 4,443,080, Cl. 354-432.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Numano, Masachik; and Morita, Minoru, 4,442,577, Cl. 29-33.00T.

Nippon Oil Co., Ltd.: *See*—
Iwai, Sakuya; and Kajikawa, Teruo, 4,443,575, Cl. 524-486.000.

Nippon Paint Co., Ltd.: *See*—
Yasuda, Zenichi; Morita, Misao; and Nakajima, Takashi, 4,443,106, Cl. 356-357.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Kume, Makoto; and Mizuno, Toshiaki, 4,443,550, Cl. 501-65.000.

Nippon Soken, Inc.: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,442,997, Cl. 251-129.000.

Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, 4,442,820, Cl. 123-571.000.
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,443,781, Cl. 338-34.000.
Nippon Steel Corporation: *See*—
Katoh, Hiroshi; Toyota, Hiromi; Koyama, Kazuo; and Komiya, Kunihiko, 4,443,272, Cl. 148-12.00C.
Nippon Telegraph & Telephone Public Corporation: *See*—
Shimazu, Nobuo; Okubo, Tsuneo; Saitou, Norio; and Ozasa, Susumu, 4,443,703, Cl. 250-491.100.
Nippondenso Co., Ltd.: *See*—
Mizuno, Toshiaki; and Takao, Mitsunori, 4,442,812, Cl. 123-417.000.
Ninomiya, Masakazu, 4,442,815, Cl. 123-436.000.
Nirasawa, Masami; and Nigara, Hideo, to Sakae Tsushin Kogyo Co. Ltd. Rotary dial unit. 4,442,724, Cl. 74-10.410.
Nishi, Tadashi: *See*—
Kondo, Tetsuya; and Nishi, Tadashi, 4,442,822, Cl. 123-643.000.
Nishida, Hirotsugu: *See*—
Shima, Masahiro; and Nishida, Hirotsugu, 4,442,683, Cl. 66-64.000.
Nishihara, Tadao. Front wheel driving device of vehicle. 4,442,914, Cl. 180-255.000.
Nishikawa, Yasuo: *See*—
Yamamoto, Nobuyuki; Nishikawa, Yasuo; Andou, Yuji; Naruo, Kyoichi; and Okita, Tsutomu, 4,443,514, Cl. 428-216.000.
Nishimatsu, Akira: *See*—
Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, 4,442,820, Cl. 123-571.000.
Nishimura, Katsuji, to Sharp Kabushiki Kaisha. Case accounting system. 4,443,692, Cl. 235-379.000.
Nishiyama, Mitsuru, to Sharp Kabushiki Kaisha. Liquid-injection passage structure contained within a display cell. 4,443,063, Cl. 350-334.000.
Nishizono, Masahisa, to Fujisawa Pharmaceutical Co., Ltd. Uric acid-lowering composition, method and use. 4,443,469, Cl. 424-275.000.
Nislick, Arthur S.: *See*—
Gelbein, Abraham P.; and Nislick, Arthur S., 4,443,620, Cl. 549-521.000.
Nissan Chemical Industries, Ltd.: *See*—
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,443,496, Cl. 427-140.000.
Nissan Motor Co., Ltd.: *See*—
Fukushima, Naoto; Iwata, Kazuroh; Hidaka, Kunihiko; and Yabuta, Keiichiro, 4,442,925, Cl. 188-282.000.
Hamai, Kyugo; Nakagawa, Yasuhiko; Nakai, Meroji; and Inoue, Ryuzaburo, 4,442,821, Cl. 123-639.000.
Kanamori, Hiroshi; Shigeya, Takehiro; and Aoki, Nobumasa, 4,443,832, Cl. 362-84.000.
Kubozuka, Takao, 4,442,814, Cl. 123-425.000.
Matsuzaki, Yoshitomi, 4,442,885, Cl. 165-25.000.
Saegusa, Nobuo, 4,442,688, Cl. 70-252.000.
Senoo, Tetsuo, 4,442,609, Cl. 33-356.000.
Tsutsumi, Saburo; Dozono, Kichihiko; Matayoshi, Yutaka; and Kunii, Kazuya, 4,442,808, Cl. 123-279.000.
Nitto Kohki Co., Ltd.: *See*—
Takeuchi, Hirosato; and Mikiya, Toshio, 4,442,828, Cl. 126-451.000.
Niwa, Yukichi; Ogino, Yasuo; Ohwada, Mitsutoshi; Tanaka, Kazuo; and Koumura, Noboru, to Canon Kabushiki Kaisha. Distance detecting device in a camera. 4,443,078, Cl. 354-403.000.
Nixdorf Computer Corporation: *See*—
Gehman, John T., 4,443,848, Cl. 364-200.000.
NLB Corp.: *See*—
Goerss, William G., 4,443,271, Cl. 134-34.000.
Noble, Allen T., to Noble Linear Irrigation, Inc. Land irrigation system and method. 4,442,974, Cl. 239-1.000.
Noble, Allen T., to Noble Linear Irrigation, Inc. Support structure for land irrigation system. 4,442,976, Cl. 239-183.000.
Noble Linear Irrigation, Inc.: *See*—
Noble, Allen T., 4,442,974, Cl. 239-1.000.
Noble, Allen T., 4,442,976, Cl. 239-183.000.
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Nakashima, Yoichi; Tsuji, Masayoshi; Aoki, Tetsuo; and Ide, Hiroyuki, to Hisamitsu Pharmaceutical Co., INc. 2,3-Dihydro-indene derivatives. 4,443,626, Cl. 562-434.000.
Noga Engineering Ltd.: *See*—
Hirsch, Gustav M.; and Bar-Nof, Moshe, 4,442,601, Cl. 30-169.000.
Nohira, Hidetaka; Ito, Sumio; and Oki, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine with an accumulation chamber. 4,442,809, Cl. 123-316.000.
Nokano, Yoshikatsu: *See*—
Matsuura, Masaaki; and Nokano, Yoshikatsu, 4,442,806, Cl. 123-198.00F.
Nomizu, Isao: *See*—
Adachi, Masami; Shimasaki, Hirato; Nomizu, Isao; and Matsuzaki, Taketo, 4,442,791, Cl. 118-669.000.
Nongbri, Govanon, to HRI, Inc. Catalyst activity in coal liquid upgrading. 4,443,330, Cl. 208-112.000.
Nooden, Robert A., to International Minerals & Chemical Corp. Coating for foundry cores and molds. 4,443,259, Cl. 106-38.270.
Norder, Stig; and Nilsson, Lars-Erik, to Aktiebolag Somas Ventiler. Electro-pneumatic signal converter. 4,442,854, Cl. 137-82.000.
Nordqvist, Sune, to Tenax Maskin AB. Method of preparing gypsum articles. 4,443,261, Cl. 106-109.000.
Norfab, Inc.: *See*—
Mehl, Donald N., 4,443,508, Cl. 428-122.000.
Norgaard, Donald E., to Nortech Laboratories Ltd. Acoustic apparatus and method. 4,443,889, Cl. 381-24.000.
Norlin Industries, Inc.: *See*—
Gross, Glenn; and Moore, Douglas R., 4,442,745, Cl. 84-1.010.
Normalair-Garrett (Holdings) Limited: *See*—
Carnegie, Alistair L., 4,442,835, Cl. 128-201.270.
Norrman, Bengt J. F.: *See*—
Tuovinen, Frans H.; Norrman, Bengt J. F.; and Heikkila, Risto M., 4,443,878, Cl. 373-9.000.
Nortech Laboratories Ltd.: *See*—
Norgaard, Donald E., 4,443,889, Cl. 381-24.000.
North American Philips Corporation: *See*—
Wank, Larry A.; and Braitling, Joseph G., 4,443,825, Cl. 360-104.000.
North Atlantic Technologies, Inc.: *See*—
Dinulescu, Horia A., 4,442,886, Cl. 165-76.000.
Northcutt, Donald R. Suspension system for electric heating elements. 4,443,881, Cl. 373-130.000.
Northern Telecom Inc.: *See*—
Kelly, Charles A. P., 4,443,758, Cl. 324-113.000.
Northern Telecom Limited: *See*—
Nakhla, Michael S., 4,443,662, Cl. 179-2.00C.
Rokas, Bernard E., 4,443,277, Cl. 156-50.000.
Northup, Stephen D.: *See*—
Migliori, Albert; and Northup, Stephen D., 4,443,837, Cl. 362-396.000.
Notheis, Patrick J.: *See*—
Meitner, Gary H.; and Notheis, Patrick J., 4,443,513, Cl. 422-195.000.
Novatome: *See*—
Plagnard, Andre, 4,443,403, Cl. 376-270.000.
Nowak, Leonard G.: *See*—
Wojcieson, Raymond J.; and Nowak, Leonard G., 4,443,182, Cl. 431-183.000.
Nowell, John R.: *See*—
Genuit, Luther L.; and Nowell, John R., 4,443,709, Cl. 307-41.000.
Nowlin, Charles H., to United States of America, Energy. Amplitude- and rise-time-compensated filters. 4,443,768, Cl. 328-167.000.
Noyori, Tatsuhiko: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tsuzuki, Hidehiro; Tabuchi, Takahisa; Masuda, Tsuneharu; and Takehata, Tetsuro, deceased, 4,443,143, Cl. 409-295.000.
Nozawa, Takamitsu: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,442,944, Cl. 215-1.00C.
Numano, Masachik; and Morita, Minoru, to Nippon Kokan Kabushiki Kaisha. Processing of steel pipes or round bars. 4,442,577, Cl. 29-33.00T.
N.V. Biscuits Delacre S.A.: *See*—
Busseniers, Roger; and Deudon, Martial, 4,442,657, Cl. 53-500.000.
NYA Asfalt AB: *See*—
Cappe, Carl, 4,442,651, Cl. 52-745.000.
Oakes, Thomas R.: *See*—
Maloney, James E.; and Oakes, Thomas R., 4,443,357, Cl. 252-321.000.
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, to Nissan Chemical Industries, Ltd. Agent and method for modifying surface layer of cement structures. 4,443,496, Cl. 427-140.000.
Obland, Donald R. Dual head edge sharpening device for skis. 4,442,636, Cl. 51-205.0WG.
Oboler, Leonard: *See*—
Dodds, Diego E. F., 4,443,389, Cl. 261-153.000.
Occidental Chemical Corporation: *See*—
Hollifield, Charles M.; and Smith, Teddy D., 4,443,421, Cl. 423-321.00R.
Occidental Oil Shale, Inc.: *See*—
Ricketts, Thomas E., 4,443,036, Cl. 299-2.000.
Ricketts, Thomas E., 4,443,037, Cl. 299-2.000.
Oce-Nederland B.V.: *See*—
Heikens, Harm H.; and Crommentuyn, Gerardus J., 4,443,527, Cl. 430-39.000.
Ochi, Shikayuki: *See*—
Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,443,812, Cl. 357-53.000.
O'Connor, Terence A., to Teledyne Republic Manufacturing. Fluid pump. 4,443,162, Cl. 417-425.000.
Odermann, Charles R.; and Zylbert, Thaddeus J., to Singer Company, The. Sewing machine bobbin for a vertical axis hook. 4,442,785, Cl. 112-279.000.
Odne, L. John: *See*—
Dahlen, Burton L.; Odne, L. John; and Ryan, John D., 4,442,833, Cl. 128-90.000.
Oeschger, Joseph E., to International Telephone & Telegraph Corporation. Low capacitance radio frequency switch. 4,443,672, Cl. 200-144.00B.
Oetiker, Hans; Linzberger, Robert; Ketting, Leendert; and Winteler, Werner, to Bebruder Buhler AG. Procedure and mechanism for the automatic control of a grinding mill roller carriage equipped with a regulated product feed. 4,442,980, Cl. 241-34.000.
Ogata, Seiya: *See*—
Hayashida, Shinsaku; Ogata, Seiya; and Yoshino, Sadazo, 4,443,542, Cl. 435-160.000.

Ogden Electronics Ltd.: *See*—
Steel, James, 4,442,915, Cl. 180-271.000.
Ogino, Yasuo: *See*—
Niwa, Yukichi; Ogino, Yasuo; Ohwada, Mitsutoshi; Tanaka, Kazuo; and Koumura, Noboru, 4,443,078, Cl. 354-403.000.
Ohashi, Shin-ichi: *See*—
Tanaka, Katsuyuki; Ohashi, Shin-ichi; Saito, Masakatsu; and Sampei, Tohru, 4,443,741, Cl. 315-307.000.
Ohba, Shinya; Nakai, Masaaki; Ozaki, Toshifumi; and Takahashi, Kenji, to Hitachi, Ltd. Solid-state imaging device. 4,443,818, Cl. 358-213.000.
Ohe, Takeshi; and Okamoto, Haruo, to Jidosha Kiki Co., Ltd. Flow control valve. 4,442,857, Cl. 137-117.000.
Ohe, Takeshi: *See*—
Masuda, Naosuke; and Ohe, Takeshi, 4,443,161, Cl. 417-310.000.
Ohgami, Masahiko: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.
Ohkubo, Sumiharu, to Mitsubishi Denki Kabushiki Kaisha. Ventilation device for a rotating electric machine. 4,443,723, Cl. 310-53.000.
Ohsaki, Takashi: *See*—
Ikegami, Shigeru; and Ohsaki, Takashi, 4,443,726, Cl. 310-248.000.
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, to Nippon Soken, Inc. Gas detecting sensor. 4,443,781, Cl. 338-34.000.
Ohtaka, Keiji, to Canon Kabushiki Kaisha. Focusing screen. 4,443,088, Cl. 354-200.000.
Ohtani, Osamu: *See*—
Senda, Shigeo; Ohtani, Osamu; Katho, Eiichi; Nagasaka, Mitsuaki; Miyake, Hidekazu; Fujiwara, Khosuke; and Tanaka, Motoaki, 4,443,607, Cl. 546-141.000.
Ohtawa, Hisao: *See*—
Itobayashi, Manabu; and Ohtawa, Hisao, 4,443,770, Cl. 330-284.000.
Ohwada, Hiroyuki, to Nippon Electric Co., Ltd. Error recovery system of a multi-processor system for recovering an error by transferring status singals from one processor to another without use of a main memory. 4,443,849, Cl. 364-200.000.
Ohwada, Mitsutoshi: *See*—
Niwa, Yukichi; Ogino, Yasuo; Ohwada, Mitsutoshi; Tanaka, Kazuo; and Koumura, Noboru, 4,443,078, Cl. 354-403.000.
Ohyama, Tadashi; and Kawata, Shoji, to Aisin Seiki Kabushiki Kaisha. Electromagnetic valve unit. 4,442,998, Cl. 251-129.000.
Oinoue, Kenichi; Hayashi, Asao; Ida, Masatoshi; Aoki, Masahiro; Nakamura, Junichi; and Fukuoka, Kenji, to Olympus Optical Co. Ltd. Method and apparatus for detecting focus condition of objective lens. 4,443,079, Cl. 354-407.000.
Oka, Kozo: *See*—
Yoshino, Masaki; Oka, Kozo; and Koide, Huminori, 4,443,093, Cl. 355-3.0CH.
Okabayashi, Ikuo: *See*—
Miyoshi, Hajime; Asanagi, Etsuo; Iguchi, Junsuke; and Okabayashi, Ikuo, 4,443,260, Cl. 106-109.000.
Okai, Tamao. Bicycle stand unit. 4,443,024, Cl. 280-304.000.
Okajima, Shinpei, to Shimano Industrial Company Limited. Pedal for a bicycle. 4,442,732, Cl. 74-594.500.
Okamoto, Haruo: *See*—
Ohe, Takeshi; and Okamoto, Haruo, 4,442,857, Cl. 137-117.000.
Okamoto, Kenji: *See*—
Kobayashi, Masayoshi; Oshizawa, Hidekazu; Okamoto, Kenji; and Sekiguchi, Akira, 4,443,852, Cl. 364-431.030.
Okamoto, Kouichi: *See*—
Hirao, Toshiki; and Okamoto, Kouichi, 4,443,722, Cl. 310-45.000.
Oki, Hisashi: *See*—
Nohira, Hidetaka; Ito, Sumio; and Oki, Hisashi, 4,442,809, Cl. 123-316.000.
Okita, Tsutomu: *See*—
Yamamoto, Nobuyuki; Nishikawa, Yasuo; Andou, Yuji; Naruo, Kyoichi; and Okita, Tsutomu, 4,443,514, Cl. 428-216.000.
Okubo, Tsuneo: *See*—
Shimazu, Nobuo; Okubo, Tsuneo; Saitou, Norio; and Ozasa, Susumu, 4,443,703, Cl. 250-491.100.
Okumura, Takatoshi: *See*—
Kaneko, Makoto; and Okumura, Takatoshi, 4,442,748, Cl. 84-1.010.
Okumura, Yoshiaki: *See*—
Namikoshi, Hajime; Okumura, Yoshiaki; and Sei, Tsuyoshi, 4,443,595, Cl. 536-58.000.
Okuno, Takeshi: *See*—
Kasamatsu, Kiyoshi; Hirano, Masachika; and Okuno, Takeshi, 4,443,438, Cl. 424-200.000.
Oldani, Karl: *See*—
Buhler, Karl; and Oldani, Karl, 4,443,880, Cl. 373-74.000.
Olin Corporation: *See*—
Brock, Andrew J.; and Mandigo, Frank N., 4,443,274, Cl. 148-6.310.
Hammond, Wayne H.; and Jones, George V., 4,443,600, Cl. 544-190.000.
Moore, Sanders H.; and Smith, Maurice R., 4,443,307, Cl. 204-98.000.
Ollenberger, Eugene. Therapeutic couch. 4,442,832, Cl. 128-71.000.
Ollivier, Jean: *See*—
Arretz, Emmanuel; Landoussy, Claude; Mirassou, Alfred; and Ollivier, Jean, 4,443,310, Cl. 204-158.00R.
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Tension roller for belt drives. 4,443,210, Cl. 474-199.000.
Olsen, Eric G., to United Technologies Corporation. Soundproofing panel mounted to effect vibration isolation. 4,442,647, Cl. 52-393.000.
Olsen, Olav, to Ingenior Thor Furuholmen A/S; A/S Hoyer-Ellefsen; and Ingenior F. Selmer A/S. Method for constructing an offshore platform structure having a plurality of supporting legs inclined inwardly towards each other. 4,443,131, Cl. 405-203.000.
Olson, Donald C., to Shell Oil Company. Method of removing hydrogen sulfide from gases utilizing a polyvalent metal chelate solution and electrolytically regenerating the solution. 4,443,423, Cl. 423-573.00G.
Olson, Donald C., to Shell Oil Company. Method of removing hydrogen sulfide from gases utilizing a polyvalent metal chelate solution and electrolytically regenerating the solution. 4,443,424, Cl. 423-573.00G.
Olympus Optical Co., Ltd.: *See*—
Mihara, Shin-ichi, 4,443,069, Cl. 350-469.000.
Oinoue, Kenichi; Hayashi, Asao; Ida, Masatoshi; Aoki, Masahiro; Nakamura, Junichi; and Fukuoka, Kenji, 4,443,079, Cl. 354-407.000.
Olympus Optical Co., Ltd: *See*—
Tanikawa, Kowji, 4,443,077, Cl. 354-21.000.
Omata, Katsumori, to Far East Engineering Co., Ltd. Automatic system for producing electrolyte impregnated capacitor elements. 4,442,588, Cl. 29-570.000.
Omata, Tetsuo: *See*—
Oshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,443,548, Cl. 435-280.000.
Omron Tateisi Electronics Co.: *See*—
Yamada, Takeshi, 4,443,838, Cl. 363-19.000.
Ono, Hironobu: *See*—
Nagase, Masaomi; Miyagi, Hideo; Ono, Hironobu; and Nakano, Jiro, 4,442,813, Cl. 123-418.000.
Ono, Keikichi; and Hirano, Hirofumi, to Canon Denshi Kabushiki Kaisha. Small serial printer. 4,443,123, Cl. 400-145.200.
Ono Pharmaceutical Co., Ltd.: *See*—
Muryobayashi, Takashi; Miyake, Hajimu; and Yamato, Takashi, 4,443,478, Cl. 424-331.000.
Ono, Takuo: *See*—
Mikami, Wataru; Nagatake, Kazuo; and Ono, Takuo, 4,443,841, Cl. 363-41.000.
Onoda, Michitosi: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitosi, 4,443,781, Cl. 338-34.000.
Onodera, Toshihiro; and Masuda, Youichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Single ended, separately driven, resonant DC-DC converter. 4,443,839, Cl. 363-20.000.
Opitz, Konrad, to Hoechst Aktiengesellschaft. Liquid reactive dyestuff preparations and their use. 4,443,224, Cl. 8-527.000.
Oppl, Gunter: *See*—
Schmitt, Gunther; Oppl, Gunter; and Patel, Kirit, 4,442,664, Cl. 57-339.000.
Optical Coating Laboratory, Inc.: *See*—
Anthon, Erik W., 4,443,873, Cl. 369-110.000.
Optical Technologies, Inc.: *See*—
Bowley, George A., 4,442,750, Cl. 84-1.180.
Optimetrix Corporation: *See*—
Johannsmeier, Karl-Heinz; and Phillips, Edward H., 4,443,096, Cl. 355-53.000.
Orlow, Ralph S., to Box Innards, Inc. Rotary apparatus for forming sheets with rounded corners. 4,442,742, Cl. 83-303.000.
Oros Company: *See*—
de Nevers, Noel H., 4,443,332, Cl. 209-331.000.
Osaka Gas Company Limited: *See*—
Shimizu, Shoji; and Mitsudomi, Hiroyuki, 4,443,183, Cl. 431-354.000.
Oshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, to Ube Industries, Ltd. Process for preparing L-α-methylphenyl alanines. 4,443,548, Cl. 435-280.000.
Oshizawa, Hidekazu: *See*—
Kobayashi, Masayoshi; Oshizawa, Hidekazu; Okamoto, Kenji; and Sekiguchi, Akira, 4,443,852, Cl. 364-431.030.
Oshlack, Benjamin; and Leslie, Stewart T., to Euroceltique, S.A. Extended action controlled release compositions. 4,443,428, Cl. 424-22.000.
Otani, Mitsunobu; Senda, Teruo; and Hirose, Michio, to Toray Industries, Inc. Biological treatment of waste water. 4,443,337, Cl. 210-602.000.
Otis Engineering Corporation: *See*—
Foust, Tommy C., 4,442,893, Cl. 166-117.500.
Gentry, Ernest B., 4,442,859, Cl. 137-242.000.
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Oude Alink, Bernardus A.; and Redmore, Derek, to Petrolite Corporation. Tetrahydrothiazole phosphonic acids or esters thereof. 4,443,609, Cl. 548-111.000.
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Overpeck, Charles D.; Overpeck, Dorothy S.; and Overpeck, George G. Easy-to-clean birdhouse. 4,442,793, Cl. 119-23.000.

Overpeck, Dorothy S.: *See—*
Overpeck, Charles D.; Overpeck, Dorothy S.; and Overpeck, George G., 4,442,793, Cl. 119-23.000.
Overpeck, George G.: *See—*
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Owen, R. Calvin, Jr.; and Plummer, William T., to Polaroid Corporation. Zone focusing optical system. 4,443,067, Cl. 350-422.000.
Owens, George H., Jr. Magnetic plumb bob holder. 4,442,610, Cl. 33-392.000.
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Ozaki, Toshifumi: *See—*
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Ozawa, Toshiaki, to Canon Kabushiki Kaisha. Printer with electromagnetically driven hammer. 4,443,124, Cl. 400-185.000.
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Pache, Norbert; and Mazac, Karel, to Kuka Schweissanlagen + Roboter GmbH. Device for arc-welding ferromagnetic workpieces under the control of a magnetic field. 4,443,686, Cl. 219-123.000.
Pacific Scientific Instruments Company: *See—*
Webster, Donald R., 4,443,108, Cl. 356-418.000.
Padilla, Amphlett G., to Upjohn Company, The. Selective halogenation of 2-fluoroaniline. 4,443,631, Cl. 564-412.000.
Padilla, Joseph R.; Richardson, Emmett M.; and Chatas, Angelos T., to Mobil Oil Corporation. Subsea well completion system. 4,442,900, Cl. 166-342.000.
Page-Wilson Corporation: *See—*
Lang, Elliot R.; and Tobolski, Edward L., 4,442,705, Cl. 73-83.000.
Pajonas, Thomas L.; Barcikowski, Gerald F.; and Ennaco, Andrew J., to Combustion Engineering, Inc. Tempering air heating on pulverizing high moisture fuels. 4,442,783, Cl. 110-347.000.
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Pampus, Gottfried: *See—*
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Musch, Rudiger; Pampus, Gottfried; Casper, Rudolf; Muller, Peter; and Gobel, Wilhelm, 4,443,583, Cl. 525-215.000.
Panico, C. Richard. Photoresist curing method. 4,443,533, Cl. 430-311.000.
Pansolli, Paolo; Barbaro, Aurelio; Maimone, Adriano; and Valdiserri, Mario, to E.N.I. Ente Nazionale Indrocarburi. Method and apparatus for the continuous separation of fructose from glucose starting from invert sugar or from isomerized glucose syrups. 4,443,267, Cl. 127-46.200.
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Papenfuhs, Theodor; and Berthold, Rudiger, to Hoechst Aktiengesellschaft. Process for preparing 2-amino-5-nitrotoluene. 4,443,630, Cl. 564-406.000.
Parker-Hannifin Corporation: *See—*
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Parra, Gilbert T.: *See—*
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Pastorino, Ronald L.; Bock, Lawrence A.; and Halle, Reidar, to Argus Chemical Corporation. Gem-diperoxyesters. 4,443,376, Cl. 260-453.0RZ.
Patarini, Leon M., to Sherwin-Williams Company, The. Quad-seal snap lock. 4,442,952, Cl. 220-354.000.
Pate, Harold T.: *See—*
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Patel, Kirit: *See—*
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Payne, Thomas R.; and Baker, Alfred L., to General Electric Company. Power control for cooking appliance with transient operating modes. 4,443,690, Cl. 219-506.000.
Pearce, William: *See—*
Buchanan, Thomas M.; Pearce, William; and Chen, Kirk C. S., 4,443,431, Cl. 424-92.000.
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Pedersen, Svend P.: *See—*
Graversen, Niels P. G.; and Pedersen, Svend P., 4,443,120, Cl. 374-201.000.
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Pentecost, Harry L.: *See—*
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Perkin-Elmer Corporation, The: *See—*
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Perl, Uwe W.: *See—*
Modur, Bhaskar S.; Perl, Uwe W.; and Smick, Donald E., 4,443,177, Cl. 425-543.000.
Perrin, Arden. Hydro-therapy apparatus. 4,443,204, Cl. 441-129.000.
Personal Products Company: *See—*
Roller, Judy, 4,443,492, Cl. 427-44.000.
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Perz, John S.: *See—*
Higgins, William A.; and Perz, John S., 4,443,577, Cl. 524-590.000.
Pesa, Frederick A.; Graham, Anne M.; and Kliewer, Wayne R., to Standard Oil Company (Indiana), The. Hydrogenation of carboxylic acids. 4,443,639, Cl. 568-885.000.
Peschges, Klaus-Jurgen, to Carl Freudenberg, Firma. Self-sealing washer. 4,443,145, Cl. 411-542.000.
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Petrolite Corporation: *See—*
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Petry, Rudolf, to Hoechst Aktiengesellschaft. Device for simultaneously deshirring, smoothing and braking a shirred tubular casing. 4,442,568, Cl. 17-33.000.
Pevzner, Efim M.: *See—*
Boev, Vladimir S.; Golev, Sergei P.; Dmitriev, Viktor I.; Pevzner, Efim M.; Yaure, Andrei G.; and Masandilov, Lev B., 4,443,748, Cl. 318-732.000.
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LaMattina, John L.; and Weeks, Paul D., 4,443,621, Cl. 560-142.000.
Pflanz, Herbert M.; and Lester, Albert B., to Electric Power Research Institute, Inc. Current sensor responsive to symmetrical and asymmetrical currents and current limiting protector utilizing same. 4,443,854, Cl. 364-483.000.
Pfleiderer, Ernst: *See—*
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Burns, Lyle D., 4,443,572, Cl. 524-120.000.
Draper, Homer L.; Holland, Floyd H.; and Brost, Robert L., 4,443,570, Cl. 524-62.000.
Layton, James E., 4,443,713, Cl. 307-260.000.
Needham, Donald G.; and Leland, John E., 4,443,571, Cl. 524-90.000.
Photis, James M., to American Cyanamid Company. Preparation of predominately methyl acrylamidoglycolate methyl ether in a normally liquid product. 4,443,623, Cl. 560-170.000.
Piaton, Alain N., to Anfor. Apparatus for reading microfiches. 4,443,858, Cl. 364-518.000.
Pickett, David A.: *See—*
Morgan, Richard L.; and Pickett, David A., 4,442,804, Cl. 123-145.00A.
Pidgeon, Brian G.; and Bavington, Clive R., to Coal Industry (Patents) Limited. Electromagnetic position detector employing fast fourier transform analysis. 4,443,792, Cl. 340-612.000.
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Piersol, Jay L.; and Koller, Frank J., Jr., to Armstrong World Industries, Inc. Low density fibrous sheet material. 4,443,262, Cl. 106-209.000.

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Pioseer Electronic Corporation: *See*—
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Pirchl, Helmut: *See*—
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PKL Papier-und Kunstoff Werke Linnich GmbH: *See*—
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Plagnard, Andre, to Novatome. Apparatus for loading and unloading fuel assemblies for a fast neutron nuclear reactor. 4,443,403, Cl. 376-270.000.

Planer, Norman G.; and Zansky, Zoltan, to Honeywell Inc. Voltage isolated gate drive circuit. 4,443,719, Cl. 307-570.000.

Pleasants, Frank M. Prefabricated panel for building construction and method of manufacturing. 4,442,826, Cl. 126-400.000.

Plummer, William T.: *See*—
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Poccia, Michael J., to Burroughs Corporation. Adjustable stroke rotary indexing mechanism. 4,442,726, Cl. 74-117.000.

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Pogany, Stefano A.: *See*—
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Poirier d'Ange d'Orsay, Emmanuel J., to S.E.V. Societe pour l'Equipement de Vehicules. Method for regulating the value of a thick film resistor and a corresponding resistor. 4,443,782, Cl. 338-195.000.

Polaroid Corporation: *See*—
Cronin, David V.; and Cocco, Vincent L., 4,443,530, Cl. 430-138.000.
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Ponteggi Est S.p.A.: *See*—
Prevedini, Cesare, 4,442,646, Cl. 52-230.000.

Post, Martin F. M.: *See*—
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Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., to Ciba-Geigy AG. Hydroquinone derivatives and their use in photographic materials. 4,443,537, Cl. 430-566.000.

Pou, Frederick M.; and Straub, Richard L., to Monarch Marking Systems, Inc. Printer with automatic stacker. 4,442,774, Cl. 101-226.000.

Pouri, Theodore H.; and Mottin, Howard C., to United States of America, Army. Carousel automatic ammunition loader system. 4,442,753, Cl. 89-46.000.

PPG Industries, Inc.: *See*—
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Prange, Uwe; El Chahawi, Moustafa; Vogt, Wilhelm; and Richtzenbain, Hermann, to Dynamit Nobel AG. Method of preparing malonic acid dialkyl esters. 4,443,624, Cl. 560-204.000.

Pravettone, John P. Dust pan and refuse container. 4,442,567, Cl. 15-257.400.

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Prevedini, Cesare, to Ponteggi Est S.p.A. Device for anchoring tensioning elements. 4,442,646, Cl. 52-230.000.

Principe, Joseph R.: *See*—
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Probst, Stewart D.: *See*—
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Procter & Gamble Company, The: *See*—
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Buckwalter, Brian L.; and LaHann, Thomas R., 4,443,473, Cl. 424-300.000.

Prokosch, Walter G.; and Marshall, Robert L. Veterinary composition and method of using same. 4,443,437, Cl. 424-195.000.

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Biedermann, Jurgen; Prop, Gerrit; and Doppelfeld, Ille-Stephanie, 4,443,464, Cl. 424-273.000.

Protocol Computers, Inc.: *See*—
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Pruett, David J.; and McTaggart, Donald R., to United States of America, Energy. Separation of uranium from technetium in recovery of spent nuclear fuel. 4,443,413, Cl. 423-10.000.

Puntener, Alois, to Ciba-Geigy Corporation. Chrome-complex dyes. 4,443,370, Cl. 260-145.00B.

Purcell, Harold: *See*—
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Purdue Frederick Company, The: *See*—
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Purrmann, Robert: *See*—
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Queneau, Paul B.; Hogsett, Robert F.; Beckstead, Leo W.; and Huggins, Dale K., to Amax Inc. Recovery of V_2O_5 and nickel values from petroleum coke. 4,443,415, Cl. 423-68.000.

Quinnell, Geoffrey C., to Marley Tile A.G. Verge member for a pitched roof and roofing system incorporating the same. 4,442,641, Cl. 52-94.000.

Quintana, Ronald P.: *See*—
Lasslo, Andrew; Quintana, Ronald P.; Dugdale, Marion; and Johnson, Randy W., 4,443,450, Cl. 424-250.000.

Radek, John R., to Ready Metal Manufacturing Company. Door control. 4,442,630, Cl. 49-115.000.

Rademacher, Friedrich, to Holstein & Kappert GmbH. Machine for filling bottles and cans. 4,442,653, Cl. 53-266.00R.

Radigan, Kenneth J.; and Cleeves, James M., to Fairchild Camera & Instrument Corp. Method of etching refractory metal film on semiconductor structures utilizing triethylamine and H_2O_2. 4,443,295, Cl. 156-657.000.

Radtke, Robert P., to Strata Bit Corporation. Drill bit. 4,442,909, Cl. 175-329.000.

Rainey, Christopher J.: *See*—
Endfield, Cyril; and Rainey, Christopher J., 4,443,789, Cl. 340-365.00R.

Rall, Bernhard; Burkhart, Johann; and Schluter, Klaus, to Licentia Patent-Verwaltungs-GmbH. Switching network for megahertz frequency signals. 4,443,773, Cl. 333-104.000.

Rambold, Wolfgang: *See*—
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Ramelot, Daniel, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Monitoring the dust content of gaseous fluid. 4,442,699, Cl. 73-28.000.

Randolph, Arthur J. Windmill tower shadow eliminator. 4,443,154, Cl. 416-11.000.

Rankel, Lillian A.: *See*—
Chen, Nai Y.; and Rankel, Lillian A., 4,443,325, Cl. 208-55.000.

Rankin, Clarence S., deceased: *See*—
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Rankin, Susan L., executrix: *See*—
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Rasor, Julia S.; and Tickner, Ernest G., to Schering, AG. Microbubble precursors and methods for their production and use. 4,442,843, Cl. 128-660.000.

Rasper, Manfred: *See*—
Dworak, Wilhelm; Fader, Martin; Jons, Claus; Mayer, Siegfried; Muller, Karl-Heinz; Rasper, Manfred; Schuldt, Dietrich; Talmon, Wolfgang; and Wolff, Guenter, 4,443,168, Cl. 418-131.000.

Raymond, Gary E. Apparatus for supplying photographic sheet materials, for use in a darkroom. 4,442,744, Cl. 83-614.000.

Rayton, Thomas R., to 236913 Alberta Ltd. Apparatus and method for producing slitted plastic produce wrappers. 4,442,740, Cl. 83-29.000.

RCA Corporation: *See*—
Ammon, George J., 4,443,869, Cl. 369-41.000.
Aschwanden, Felix; and Groeneweg, Willem H., 4,443,769, Cl. 329-50.000.
Chen, Hsing-Yao, 4,443,736, Cl. 313-414.000.
Dholakia, Anil R., 4,443,871, Cl. 369-71.000.
Gange, Robert A., 4,443,664, Cl. 179-5.500.
Kirschner, Thomas F., 4,443,872, Cl. 369-77.200.
Lipp, Steven A., 4,443,499, Cl. 427-258.000.
Schwarzmann, Alfred, 4,443,772, Cl. 333-28.00R.
Swartz, George A., 4,443,651, Cl. 136-249.000.

Ready Metal Manufacturing Company: *See*—
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Reale, Lucio V.; and McKay, William R. Treatment of underground beds. 4,442,896, Cl. 166-278.000.

REB Manufacturing, Inc.: *See*—
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Reckitt & Colman Products Limited: *See*—
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Recon Ltd.: *See*—
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Redmann, Frank W. Apparatus for catching cattle. 4,442,794, Cl. 119-115.000.

Redmore, Derek: *See*—
Oude Alink, Bernardus A.; and Redmore, Derek, 4,443,609, Cl. 548-111.000.
Reece, Chester A. Concrete panel. 4,442,648, Cl. 52-468.000.
Reed, Barrie T. Flying splice apparatus. 4,443,291, Cl. 156-504.000.
Reese, Theodore J. Method of operating a blast furnace. 4,443,251, Cl. 75-42.000.
Regie Nationale des Usines Renault: *See*—
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Reichert, James K.; and Stott, Michael A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Variable phase lock control. 4,443,767, Cl. 328-155.000.
Reid, John H. Conversion of plug flow and complete mix aeration basins to barrier oxidation ditches. 4,443,338, Cl. 210-629.000.
Reinherz, Ellis L.; and Schlossman, Stuart F., to Sidney Farber Cancer Institute, Inc. Monoclonal antibody. 4,443,427, Cl. 424-1.100.
Reith, Walter: *See*—
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Reliance Electric Co.: *See*—
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Rempfler, Hermann; and Fory, Werner, to Ciba-Geigy Corporation. Pyridyloxy-phenoxyalkanecarbonyl oxime derivatives. 4,443,247, Cl. 71-94.000.
REPA Feinstanzwerk GmbH: *See*—
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Repligen Corporation: *See*—
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Reynolds, Desmond H. J., to Lucas Industries Public Limited Company. Control valve assemblies for two pedal-operated hydraulic braking systems. 4,442,671, Cl. 60-547.100.
Rhoads, Gerald A., Jr.: *See*—
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Rhoads, Gerald A., Sr., to X-Pert Well Service, Inc.; and Rhoads, Gerald A., Jr., a part interest. Emergency escape device. 4,442,918, Cl. 182-10.000.
Ricciardi, Mario, to AM International, Inc. Duplicating machine with duplexing capability. 4,443,094, Cl. 355-3.0SH.
Richards, Lawrence J., to Braner Enterprises, Inc. Turret stacker. 4,443,147, Cl. 414-71.000.
Richardson, Emmett M.: *See*—
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Prange, Uwe; El Chahawi, Moustafa; Vogt, Wilhelm; and Richtzenbain, Hermann, 4,443,624, Cl. 560-204.000.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Explosive expansion of formation in lifts for forming an in situ oil shale retort. 4,443,036, Cl. 299-2.000.
Ricketts, Thomas E., to Occidental Oil Shale, Inc. Method for controlling void fraction distribution in an in situ oil shale retort. 4,443,037, Cl. 299-2.000.
Rico, Miguel. Tooth root extractor. 4,443,196, Cl. 433-158.000.
Ricoh Col, Ltd.: *See*—
Fujioka, Yoshisato, 4,443,070, Cl. 350-464.000.
Ricoh Company, Ltd.: *See*—
Murano, Tamio; Yamane, Satoshi; Suzuki, Toshitatsu; and Fukushima, Yoshio, 4,443,082, Cl. 354-145.100.
Nagasawa, Kiyoto; and Yamada, Hiroshi, 4,443,097, Cl. 355-68.000.
Tsushima, Shuichi; and Matsumoto, Fuyuhiko, 4,443,095, Cl. 355-14.00R.
Ridenour, Ralph G. Tube-to-tube joint method. 4,442,586, Cl. 29-511.000.
Rider, Billie F., to Rockwell International Corporation. Piezoceramic bender element having an electrode arrangement suppressing signal development in mount region. 4,443,729, Cl. 310-330.000.
Riedhammer, Thomas M.: *See*—
Smith, Francis X.; and Riedhammer, Thomas M., 4,443,429, Cl. 424-78.000.
Ries, Hans M.: *See*—
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Rieter Machine Works, Ltd.: *See*—
Muller, Kurt; and Wirz, Armin, 4,443,689, Cl. 219-469.000.
Rigg, Steven H.: *See*—
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Riggs, Darius O.: *See*—
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Rikagaku Kenkyusho: *See*—
Horikoshi, Koki; Shibanai, Ichiro; and Kato, Takashi, 4,443,323, Cl. 208-11.0LE.
Riker Laboratories, Inc.: *See*—
Gerster, John F.; and Stern, Richard M., 4,443,447, Cl. 424-248.530.
Riley, David J.; and McGreavy, Gerald, to Chloride Silent Power Limited. Methods of and apparatus for making cathode electrodes for sodium sulphur cells. 4,443,172, Cl. 425-112.000.
Rinehart, Jay K., to PPG Industries, Inc. Antidotal compounds for use with herbicides. 4,443,628, Cl. 564-209.000.
Ringhardtz, Ingo, to Perkin-Elmer Corporation, The. Fluorimeter sampling apparatus. 4,443,104, Cl. 356-246.000.
Risch, Daniel T.: *See*—
Brenholt, David L.; and Risch, Daniel T., 4,443,235, Cl. 55-218.000.
Risgin, Geraldine J., administratrix: *See*—
Risgin, Ojars, deceased; and Risgin, Geraldine J., administratrix, 4,443,791, Cl. 340-634.000.
Risgin, Ojars, deceased; and by Risgin, Geraldine J., administratrix. Self-compensating gas detection apparatus. 4,443,791, Cl. 340-634.000.
Rite-Hite Corporation: *See*—
Hahn, Norbert; Hipp, Steven J.; and Swessel, Michael A., 4,443,150, Cl. 414-401.000.
Rivier, Jean E. F.: *See*—
Sherwood, Nancy M.; Eiden, Lee E.; Brownstein, Michael J.; Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,443,368, Cl. 260-112.5LH.
Roane, James B. Endodontic instrument. 4,443,193, Cl. 433-102.000.
Robert Bosch GmbH: *See*—
Auth, Werner; and Felger, Gunter, 4,442,817, Cl. 123-489.000.
Brautigam, Rolf; Wesemeyer, Jurgen; and Zobl, Hartmut, 4,443,835, Cl. 362-300.000.
Dworak, Wilhelm; Fader, Martin; Jons, Claus; Mayer, Siegfried; Muller, Karl-Heinz; Rasper, Manfred; Schuldt, Dietrich; Talmon, Wolfgang; and Wolff, Guenter, 4,443,168, Cl. 418-131.000.
Eheim, Franz, 4,442,810, Cl. 123-357.000.
Haberland, Siegfried, 4,442,816, Cl. 123-457.000.
Latsch, Reinhard; Schlembach, Hans; and Scherenberg, Dieter, 4,442,807, Cl. 123-263.000.
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Robertshaw Controls Company: *See*—
Genbauffe, Francis S.; and Erdelsky, Joseph J., 4,442,875, Cl. 141-348.000.
Robeson, Lloyd M.; and Matzner, Markus, to Union Carbide Corporation. Impact modified polyarylate blends. 4,443,581, Cl. 525-92.000.
Robinson, Tibor: *See*—
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Robotic Vision Systems, Inc.: *See*—
DiMatteo, Paul; and Ross, Joseph, 4,443,705, Cl. 250-558.000.
DiMatteo, Paul; and Ross, Joseph, 4,443,706, Cl. 250-558.000.
Rochez, Claude: *See*—
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Rockwell International Corporation: *See*—
DeLong, Vincent R., 4,443,660, Cl. 178-22.040.
Molina, Orlando G., 4,443,350, Cl. 252-62.540.
Rider, Billie F., 4,443,729, Cl. 310-330.000.
Wong, George S.; Catterfeld, Fritz C.; and Hauenstein, Clifford A., 4,443,152, Cl. 415-143.000.
Rodriguez, Ludovic; and Baltes, Eugene, to UCB, Societe Anonyme. 2-[4-(Diphenylmethylene)-1-piperidinyl]-acetic acids and their amides. 4,443,460, Cl. 424-267.000.
Roehrs, Robert E.: *See*—
Garabedian, Michael E.; and Roehrs, Robert E., 4,443,432, Cl. 424-127.000.
Roesch, Egon: *See*—
Witte, Ernst-Christian; Wolfe, Hans P.; Stegmeier, Karlheinz; and Roesch, Egon, 4,443,477, Cl. 424-319.000.
Rogers, Jack S., to Milliken Research Corporation. Warp knit sign fabric. 4,443,516, Cl. 428-253.000.
Rogers, Peter L.; and Tribe, David E., to Unisearch Limited. Semibatch ethanol production. 4,443,543, Cl. 435-161.000.
Rogers, Peter L.; and Tribe, David E., to Unisearch Limited. Ethanol production in a continuous process with cell recycle. 4,443,544, Cl. 435-162.000.
Rohm GmbH: *See*—
May, Max; Monsheimer, Rolf; and Pfleiderer, Ernst, 4,443,221, Cl. 8-94.160.
Rohm and Haas Company: *See*—
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Nemec, Joseph W.; and Cholod, Michael S., 4,443,383, Cl. 260-465.200.
Rohser, Helmut, to Hoechst Aktiengesellschaft. Process for dyeing textile sheet-like structures made of polyester fibers for use as warning protective clothing. 4,443,226, Cl. 8-532.000.
Rokas, Bernard E., to Northern Telecom Limited. Method of making a telecommunications cable from a shaped planar array of conductors. 4,443,277, Cl. 156-50.000.
Rolfe, Robert M.; and Shoji, Masakazu, to Bell Telephone Laboratories, Incorporated. Single terminal negative capacitance generator for response time enhancement. 4,443,882, Cl. 375-36.000.
Roller, Judy, to Personal Products Company. Rate of absorbency of substrates containing in-situ polymerized monomers. 4,443,492, Cl. 427-44.000.
Rom, Ernst: *See*—
Hirschmanner, Franz; and Rom, Ernst, 4,442,690, Cl. 72-128.000.
Rose, Allen J.: *See*—
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Rose, Leon A.: *See*—
Swapceinski, John P.; Rose, Leon A.; Probst, Stewart D.; McKeown, Donald G.; and Hilbert, Thomas K., 4,442,790, Cl. 118-657.000.

Rose, Robert H.; and Rose, Allen J. Apparatus and method for runnerless transfer molding of thermoset compounds. 4,443,175, Cl. 425-208.000.

Rosenwald, Peter: *See*—
Atlas, Sheldon M., 4,443,515, Cl. 428-224.000.

Rosevear, Alan, to United Kingdom Atomic Energy Authority. Composite materials. 4,443,339, Cl. 210-635.000.

Ross, Joseph: *See*—
DiMatteo, Paul; and Ross, Joseph, 4,443,705, Cl. 250-558.000.
DiMatteo, Paul; and Ross, Joseph, 4,443,706, Cl. 250-558.000.

Roth, William F.; and Snyder, Nevin, to New Way Packaging Machinery, Inc. Tapered article labelling machine and method. 4,443,285, Cl. 156-215.000.

Rothman, Michael G.: *See*—
Shugarman, Lynn E.; Shugarman, Alvin E.; and Rothman, Michael G., 4,443,334, Cl. 210-168.000.

Rothmeier, Wolfgang: *See*—
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Rousseau, David G., to United States of America, Navy. Leading edge augmentor wing-in-ground effect vehicle. 4,442,986, Cl. 244-12.100.

Roussel Uclaf: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,443,617, Cl. 549-302.000.

Rowe, Monty L.: *See*—
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Roy, Ashutosh, to THORN EMI plc. Fluorescent lamp having support wires made with austenitic steel. 4,443,738, Cl. 313-491.000.

Rozycki, Marek L., to Litton Resources Systems, Inc. Power stage servo valve for a seismic vibrator. 4,442,755, Cl. 91-39.000.

Rubin, William L., to Sperry Corporation. Spread spectrum radar. 4,443,799, Cl. 343-17.2PC.

Rudolph, Werner; and Fernschild, Guenter, to Kali-Chemie AG. Process for improving the thermal stability of fluoro-chloro-hydrocarbon. 4,442,676, Cl. 60-671.000.

Russell, Robert J. Draft control system. 4,443,181, Cl. 431-6.000.

Russo, Louis: *See*—
Luo, Tatao; Russo, Louis; and Freenor, Francis J., III, 4,443,372, Cl. 260-239.00A.

Russo, Peter J. Method of forming anchor bolts. 4,442,562, Cl. 10-27.00R.

Rutkowski, Richard G.: *See*—
Hoover, John W.; Chapman, Raymond C.; Dammassa, Dominick F.; and Rutkowski, Richard G., 4,443,827, Cl. 360-132.000.

Rutledge, Raleigh N.: *See*—
Hahn, Granville J.; and Rutledge, Raleigh N., 4,443,397, Cl. 264-171.000.

Ryan, David M.; and Simmons, Paul A. System and method for selecting and segregating containers. 4,443,697, Cl. 250-223.00R.

Ryan, John D.: *See*—
Dahlen, Burton L.; Odne, L. John; and Ryan, John D., 4,442,833, Cl. 128-90.000.

S-Cubed: *See*—
Lagus, Peter L.; and Peterson, Edward W., 4,442,895, Cl. 166-250.000.

S.E.V. Societe pour l'Equipement de Vehicules: *See*—
Poirier d'Ange d'Orsay, Emmanuel J., 4,443,782, Cl. 338-195.000.

Saccocio, Edward J.; and Holycross, Mark E., to International Telephone and Telegraph Corporation. Apparatus for improved low temperature ashing in a plasma. 4,443,409, Cl. 422-186.040.

Sadowski, Peter L., to Molecular Genetics, Inc. Production of monoclonal antibodies against bacterial adhesins. 4,443,549, Cl. 436-548.000.

Saegusa, Nobuo, to Nissan Motor Company, Limited. Vehicle steering lock arrangement. 4,442,688, Cl. 70-252.000.

Saegusa, Takashi, to Nippon Kogaku K.K. Exposure control apparatus based on multimetering system. 4,443,080, Cl. 354-432.000.

Saemann, Karl L., to Deere & Company. Window assembly. 4,443,035, Cl. 296-190.000.

Sageman, David; and Mitchell, David S., to Chevron Research Company. Gasification process for carbonaceous materials. 4,443,229, Cl. 48-197.00R.

Sahay, Bharat B.; and Jones, James J., to Texas Instruments Incorporated. Electrically controlled programmable digital thermostat and method for regulating the operation of multistage heating and cooling systems. 4,442,972, Cl. 236-1.0EA.

Saint-Gobain Vitrage: *See*—
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Saito, Koichi; Mino, Yasutake; Nakatani, Nobuo; and Murakami, Ryoichi. Method for replenishing chemical in zinc phosphate treatment. 4,443,273, Cl. 148-6.15Z.

Saito, Masakatsu: *See*—
Tanaka, Katsuyuki; Ohashi, Shin-ichi; Saito, Masakatsu; and Sampei, Tohru, 4,443,741, Cl. 315-307.000.

Saito, Masami: *See*—
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Saito, Mitsunori: *See*—
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Saito, Tadao: *See*—
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Saitou, Norio: *See*—
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Sakaeda, Keiko: *See*—
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Sakagami, Teruo; Arakawa, Noriyuki; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Gel chromatography material. 4,443,366, Cl. 260-112.00R.

Sakaguchi, Yuriko: *See*—
Obitsu, Masamichi; Hori, Takahiro; Koinuma, Toyoji; and Sakaguchi, Yuriko, 4,443,496, Cl. 427-140.000.

Sakai, Margaret. Method of teaching the pronounciation and spelling and distinguishing between the written and spoken form of any language. 4,443,199, Cl. 434-170.000.

Sakai, Shinji: *See*—
Hosoe, Kazuya; Kinoshita, Takao; Shinoda, Nobuhiko; Sakai, Shinji; Kawabata, Takashi; and Ito, Tadashi, 4,443,086, Cl. 354-409.000.

Sakakibara, Youzou: *See*—
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Sakamoto, Hitoshi, to Sony Corporation. Controlling the trace of a rotary head. 4,443,823, Cl. 360-77.000.

Sakata, Hideo; and Saito, Masami, to Mitutoyo Mfg. Co., Ltd. Measuring instrument. 4,442,607, Cl. 33-1.00M.

Sakata, Hirotsugu; Nagatomo, Shigemi; and Matsuzaka, Takashi, to Tokyo Shibaura Denki Kabushiki Kaisha. Turbine for use in refrigeration cycle. 4,442,682, Cl. 62-401.000.

Sakowicz, Jerome K.: *See*—
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Sakuragi, Shiro; Imagawa, Kyoshiro; Kotani, Haruo; Saito, Mitsunori; and Haga, Tomoyuki, to Horiba, Ltd. CO_2 Laser machining apparatus. 4,443,684, Cl. 219-121.0LH.

Sakurai, Atsushi, to Canon Kabushiki Kaisha. Character processing device. 4,443,794, Cl. 340-748.000.

Sakurai, Isao; and Minejima, Teruo, to Konishiroku Photo Industry Co., Ltd. Recording paper separation failure release for copying machine. 4,443,101, Cl. 355-14.0SH.

Sakurai, Kazuhiro: *See*—
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Sakurai, Masao; and Wada, Tetsuo, to Toyo Engineering Corporation; and Mitsui Coke Co., Ltd. Method for continuous thermal cracking of heavy petroleum oil. 4,443,328, Cl. 208-106.000.

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Samejima, Masayoshi; and Hirata, Goichi, to Tanabe Seiyaku Co., Ltd. Method of preparing microcapsules. 4,443,497, Cl. 427-213.360.

Samejima, Yasushi: *See*—
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Samodovitz, Arthur J. Tapered wave transducer. 4,443,733, Cl. 310-369.000.

Samol, Gerd W.; and Pittel, Horst, to Metzeler Kautschuk GmbH. Gasket frame made of elastomer material. 4,443,018, Cl. 277-189.000.

Sampei, Tohru: *See*—
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Samson, J. E. Benoit; Duncan, Lawrence W.; and Steffler, Jean C., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Malignant hyperthermia mattress. 4,442,838, Cl. 128-369.000.

Sanai, Susumu; and Kojima, Kiyoshi, to Matsushita Electric Industrial Co., Ltd. Mn—Al—C Alloys for anisotropic permanent magnets. 4,443,276, Cl. 148-31.570.

Sandhaus, Jeffrey. Unitary screw-type safety closure and closure-container combination. 4,442,945, Cl. 215-218.000.

Sandman, Terry L.: *See*—
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Sandoz Ltd.: *See*—
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Sandstrom, Paul H., to Goodyear Tire & Rubber Company, The. Pneumatic rubber tire having co-cured, removable or removed inner liner. 4,443,279, Cl. 156-123.000.

Sanford, Robert F., to Texas Instruments Incorporated. Multilevel bar code reader. 4,443,694, Cl. 235-465.000.

Sanghvi, Narendra T.: *See*—
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Sankey, Mark: *See*—
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Sarkisian, Ira. Paint shield roll. 4,443,283, Cl. 156-211.000.
Sartain, Don M., to Esdale, Robert T.; and Esdale, Dorothy A. Fishing lure with retractable hooks. 4,442,622, Cl. 43-35.000.
Sashiki, Takashi; and Sakaeda, Keiko, to Kabushiki Kaisha Ishida Koki Seisakusho. Combinatorial weighing apparatus. 4,442,932, Cl. 198-366.000.
Sato, Kunito; and Theiler, Richard F., to Armour Food Company. Method for inhibiting nitrosamine formation during cooking of meat. 4,443,483, Cl. 426-266.000.
Sato, Robert N.: *See*—
Alexander, David H.; Ishizuka, Kachu; and Sato, Robert N., 4,443,107, Cl. 356-373.000.
Sato, Tadao; Ishii, Toshihiko; and Setaka, Nobuo, to National Institute for Researches in Inorganic Materials. Process for producing cubic system boron nitride. 4,443,420, Cl. 423-290.000.
Sato, Tomoari: *See*—
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Sauder, Robert A., to Sauder Industries, Inc. Insulation and the provision thereof. 4,443,509, Cl. 428-137.000.
Sauer, Baldur: *See*—
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Sawada, Koji, to Nippon Engineer Service Kabushiki Kaisha. Method of and apparatus for inspecting liquid storage tanks for leaks by means of pressure decrease and increase. 4,442,702, Cl. 73-49.200.
Sawada, Susumu; Yoshida, Yoshikazu; and Tanaka, Minoru, to Mitsubishi Kasei Kogyo Kabushiki Kaisha. Method and apparatus for fusing together thermoplastic synthetic resin molded articles. 4,443,288, Cl. 156-304.600.
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magneto-resistive effect type magnetic head. 4,443,826, Cl. 360-113.000.
Schafer, Heinz; and Schrader, Wilhelm, to Westalische Metall Industrie KG Hueck & Co. Interior lighting for vehicles with rotatable mask. 4,443,834, Cl. 362-280.000.
Schairer, Werner: *See*—
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Schaper, Helmut; and Kurland, Heinrich, to Braunschweigische Maschinenbauanstalt AG. Continuously operating sugar centrifuge. 4,443,266, Cl. 127-19.000.
Scheer, Erich: *See*—
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Scherenberg, Dieter: *See*—
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Schermutzki, Konrad; and Weber, Wolfgang, to Santrade, Ltd. Crystallizing apparatus. 4,443,412, Cl. 422-247.000.
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Schiffner, Gerhard, to Siemens Aktiegesellschaft. Sensing device having a multicore optical fiber as a sensing element. 4,443,698, Cl. 250-227.000.
Schlembach, Hans: *See*—
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Schlumberger Technology Corporation: *See*—
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Schmidt, Lawrence R.; and Lovgren, Eric M., to General Electric Company. Method for making polyetherimide. 4,443,591, Cl. 528-128.000.
Schmidt, Lawrence R.; Lovgren, Eric M.; and Meissner, Peter G., to General Electric Company. Method for making polyetherimide. 4,443,592, Cl. 528-128.000.
Schmidt, Paul H.: *See*—
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Schmidt, Rudolf: *See*—
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Schmidt, Werner: *See*—
Meinecke, Dieter; Schmidt, Werner; Schussler, Rudolf; and van Rijckevorsel, Rainer, 4,442,836, Cl. 128-314.000.
Schmitt, Gunther; Oppl, Gunter; and Patel, Kirit, to FAG Kugelfischer Georg Schafer & Co. False-twist apparatus. 4,442,664, Cl. 57-339.000.
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; Hubner, Heinz-Joachim; and Burger, Bernd, to Abitz, Morf, Gritschneder. 1,2,6-Thiadiazine-3,5-dione-1,1-dioxides and their use as polymerization accelerators. 4,443,587, Cl. 526-146.000.
Schmoll, Heinz: *See*—
Fusser, Hermann; Groos, Horst; and Schmoll, Heinz, 4,442,694, Cl. 72-453.010.
Schmolmann, Horst; and Schmolmann nee Holstein, Renate, to Interglas-Textil GmbH. Bulletproof arrangement of woven, knitted or the like fabrics. 4,443,506, Cl. 428-102.000.
Schmolmann nee Holstein, Renate: *See*—
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Schnabel, Wolfram: *See*—
Meyer, Kurt; Reh, Lothar; Hirsch, Martin; Schnabel, Wolfram; and Serbent, Harry, 4,443,250, Cl. 75-26.000.
Schneebeli, Friedrich: *See*—
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Schneider, Connie J.: *See*—
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Schneider, Michael: *See*—
Knecht, Adolph; Schneider, Michael; and Ambrosch, Walter, 4,443,433, Cl. 424-157.000.
Schneider, Robert V., III: *See*—
Le Blanc, Joseph R., Jr.; Moore, Dewey O.; and Schneider, Robert V., III, 4,443,560, Cl. 518-703.000.
Schneider, Siegfried, to Gestetner Manufacturing Limited. Phase locked loop motor control system. 4,443,742, Cl. 318-85.000.
Schonwald, Siegfried: *See*—
Bentele, Benedikt; Schmid, Norbert; and Schonwald, Siegfried, 4,443,158, Cl. 417-68.000.
Schopf, Larry D.; Sakowicz, Jerome K.; and Trenk, Hugh L., to General Foods Corporation. Buttered table syrup in polyolefin bottle. 4,443,482, Cl. 426-106.000.
Schrader, Wilhelm: *See*—
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Schreiber, William L.: *See*—
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,443,633, Cl. 568-445.000.
Schroder, Manfred; and Subramanyam, Arty R. T., to Lackwerke Wulfing GmbH & Co. Process for the production of thermosetting aqueous electrocoating compositions susceptible of being cathodically deposited and the use thereof. 4,443,569, Cl. 523-414.000.
Schroeder, Kenneth W.: *See*—
Isaacson, Bruce G.; Gruetzmacher, Ralph W.; and Schroeder, Kenneth W., 4,443,759, Cl. 324-216.000.
Schuldt, Dietrich: *See*—
Dworak, Wilhelm; Fader, Martin; Jons, Claus; Mayer, Siegfried; Muller, Karl-Heinz; Rasper, Manfred; Schuldt, Dietrich; Talmon, Wolfgang; and Wolff, Guenter, 4,443,168, Cl. 418-131.000.
Schulte-Elte, Karl H.; Muller, Bernard L.; and Maillefer, Eric, to Firmenich SA. Macrocyclic carbonyl compounds, process for their preparation and their use as starting materials for the preparation of bicyclic unsaturated hydrocarbons. 4,443,632, Cl. 568-375.000.
Schultz, Ronald E.; and Rigg, Steven H., to Allen-Bradley Co. Processor module for a programmable controller. 4,443,865, Cl. 364-900.000.
Schungel, Peter, to Klockner-Becorit GmbH. Clamp ring device for the securing and removal of a cover over a pressure vessel. 4,443,016, Cl. 277-73.000.
Schurter, Rolf: *See*—
Fory, Werner; Gass, Karl; Meyer, Willy; and Schurter, Rolf, 4,443,243, Cl. 71-93.000.
Schussler, Rudolf: *See*—
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Schutt, William R.; and Booth, Stephen R. System for installing continuous anode in deep bore hole. 4,442,903, Cl. 166-385.000.
Schwarzmann, Alfred, to RCA Corporation. Switching microwave integrated bridge T group delay equalizer. 4,443,772, Cl. 333-28.00R.
Scieri, Frank; and Miller, Richard L. Hydro electric generating system. 4,443,707, Cl. 290-4.00R.
SCM Corporation: *See*—
Woo, James T. K., 4,443,568, Cl. 523-406.000.
Sealectro Corporation: *See*—
Berezowski, Jaroslaw; and Feinman, Harvey M., 4,443,693, Cl. 235-458.000.
Secrist, Duane R.; Clark, James M.; and Grindstaff, Henry E., to Great Lakes Carbon Corporation. Anode assembly for molten salt electrolysis. 4,443,314, Cl. 204-243.00R.
Sedlak, Adolf: *See*—
Stotz, Gerhard; Sedlak, Adolf; and Skwarek, Jean-Pierre, 4,443,112, Cl. 368-37.000.
Seguin, Pierre. Remote control cable for transmitting electrical signals and process and apparatus for production thereof. 4,443,658, Cl. 174-113.00C.
Sei, Tsuyoshi: *See*—
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Seibolt, Bernard P.: *See*—
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Seidel, Hans: *See*—
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Seidel, Joseph: *See*—
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Seidler, Helmut; Soll, Manfred; and Wunderlich, Klaus, to Bayer Aktiengesellschaft. Sulphur dyestuffs. 4,443,369, Cl. 260-131.000.
Seifert, Kurt, to Robert Bosch GmbH. Fuel injection nozzle for internal combustion engines. 4,442,978, Cl. 239-453.000
Seifert, Thomas P.; and Longfield, Warren E., to Babcock & Wilcox Company, The. Single drum all-welded boiler. 4,442,800, Cl. 122-379.000.
Seiko Instruments & Electronics Ltd.: *See*—
Kaneko, Noboru; and Tabata, Junichi, 4,443,115, Cl. 368-82.000.
Seino, Akira; Takamori, Kazuo; and Morinaga, Kaoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Rotation signal detection device of DC motor with brushes. 4,443,745, Cl. 318-461.000.
Sekiguchi, Akira: *See*—
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Seman, Edward J., to Westinghouse Electric Corp. Fixture for laser scribing (of dendrite silicon cells). 4,443,685, Cl. 219-121.0LH.
Sember, James W., to General Electric Company. Variable aspect arc chute. 4,443,673, Cl. 200-144.00R.
Senatore, Arnold. Lubricating die holder. 4,442,689, Cl. 72-41.000.
Senco Products, Inc.: *See*—
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Senda, Shigeo; Ohtani, Osamu; Katho, Eiichi; Nagasaka, Mitsuaki; Miyake, Hidekazu; Fujiwara, Khosuke; and Tanaka, Motoaki, to Maruko Seiyaku Co., Ltd.; and Taiho Pharmaceutical Co., Ltd. 1(2H)-Isoquinolone compounds and acid addition salts thereof. 4,443,607, Cl. 546-141.000.
Senda, Teruo: *See*—
Otani, Mitsunobu; Senda, Teruo; and Hirose, Michio, 4,443,337, Cl. 210-602.000.
Senoo, Tetsuo, to Nissan Motor Company, Limited. Vehicle orientation detecting device for an automotive vehicle or another vehicle. 4,442,609, Cl. 33-356.000.
Seo, Iwao: *See*—
Kitamura, Mitsuaki; Nakayama, Toshio; Kamimura, Kunio; Seo, Iwao; and Yaguchi, Tomonobu, 4,443,730, Cl. 310-330.000.
Seragnoli, Enzo, to G.D. Societa' per Azioni. Cigarette-making machine. 4,442,848, Cl. 131-108.000.
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Stroetmann, Michael, 4,442,655, Cl. 53-428.000.
Serbent, Harry: *See*—
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Sexton, John L. Apparatus for stringing well pipe or casing. 4,442,907, Cl. 173-164.000.
Seyfried, Donald N.: *See*—
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Seymus, Herman E.: *See*—
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Shaftner, Robert S.; Chambers, Norman D.; Kagan, Michael A.; and Briggs, Eugene C., to Koehring Company. Portable heater with integrated control system. 4,443,187, Cl. 432-222.000.
Shah, Jayantkumar R.: *See*—
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Shah, Kanu G., to Dana Corporation. Gasketing material. 4,443,517, Cl. 428-281.000.
Shah, Tushar K.: *See*—
Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., 4,442,679, Cl. 62-123.000.
Sharp, Bernard C., to Parker-Hannifin Corporation. Windshield wiper blade refill unit. 4,442,566, Cl. 15-250.420.
Sharp Kabushiki Kaisha: *See*—
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Funada, Fumiaki; Takamatsu, Toshiaki; and Wada, Tomio, 4,443,819, Cl. 358-236.000.
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,443,856, Cl. 364-513.500.
Kumata, Kiyoshi, 4,443,114, Cl. 368-73.000.
Nishimura, Katsuji, 4,443,692, Cl. 235-379.000.
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Sharrow, Robert F.; and Sherman, Sidney L. Knife guide. 4,442,595, Cl. 30-2.000.
Shatterproof Glass Corporation: *See*—
McKelvey, Harold E., 4,443,318, Cl. 204-298.000.
Shaw, Wilfrid G.: *See*—
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Shell, Donald P.: *See*—
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Shell Oil Company: *See*—
Boelema, Sikko J. A.; Post, Martin F. M.; and Sie, Swan T., 4,443,561, Cl. 518-704.000.
Lutz, Eugene F., 4,443,418, Cl. 423-226.000.
McLaughlin, William A., 4,443,635, Cl. 568-728.000.
Olson, Donald C., 4,443,423, Cl. 423-573.00G.
Olson, Donald C., 4,443,424, Cl. 423-573.00G.
van der Meijden, Johannes; and de Vries, Auke F., 4,443,640, Cl. 585-418.000.
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Shelton, Gerald L.: *See*—
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Sheridan, James E.: *See*—
Flachbarth, Charles T.; Benscoter, Richard D.; and Sheridan, James E., 4,443,654, Cl. 174-48.000.
Sheridan, Raymond J. Method of playing chess football. 4,443,011, Cl. 273-247.000.
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Sherman, William D., to REB Manufacturing, Inc. Lift platform automatic ramp barrier. 4,442,921, Cl. 187-8.520.
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Sherwin-Williams Company, The: *See*—
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Sherwood, Nancy M.; Eiden, Lee E.; Brownstein, Michael J.; Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., to Salk Institute for Biological Studies, The. Peptides affecting gonadal function. 4,443,368, Cl. 260-112.5LH.
Shibanai, Ichiro: *See*—
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Shields, Charles E.; and Giese, Leonard R. Stripping machine for removing insulation from flat cable. 4,442,587, Cl. 29-564.400.
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Shigeya, Takehiro: *See*—
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Shihabi, David S.; and Lutner, John D., to Mobil Oil Corporation. Method for reducing catalyst aging in the production of catalytically hydrodewaxed products. 4,443,327, Cl. 208-97.000.
Shiibayashi, Masao: *See*—
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Shima Idea Center Co., Ltd.: *See*—
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Shima, Masahiro; and Nishida, Hirotsugu, to Shima Idea Center Co., Ltd. Stitch pressing device for flat knitting machine. 4,442,683, Cl. 66-64.000.
Shimamura, Haruo; and Yamaoka, Yasuhiro, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for expediting the starting of an internal combustion engine. 4,442,811, Cl. 123-376.000.
Shimano Industrial Company Limited: *See*—
Okajima, Shinpei, 4,442,732, Cl. 74-594.500.
Shimano, Keizo, 4,443,008, Cl. 272-73.000.
Shimano, Keizo, to Shimano Industrial Company Limited. Running type health promoting device. 4,443,008, Cl. 272-73.000.

Shimasaki, Hirato: *See—*
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Shimazu, Nobuo; Okubo, Tsuneo; Saitou, Norio; and Ozasa, Susumu, to Nippon Telegraph & Telephone Public Corporation; and Hitachi, Ltd. Method and apparatus of deflection calibration for a charged particle beam exposure apparatus. 4,443,703, Cl. 250-491.100.
Shimizu, Hiroshi; Fukano, Yoshisama; and Yoshizawa, Minoru, to Toray Silicone Company, Ltd. Foam control compositions. 4,443,359, Cl. 252-358.000.
Shimizu, Shoji; and Mitsudomi, Hiroyuki, to Osaka Gas Company Limited. Combustion apparatus. 4,443,183, Cl. 431-354.000.
Shimoda, Mituhiko: *See—*
Tomori, Yasumasa; Shimoda, Mituhiko; and Haraguchi, Keisuke, 4,443,085, Cl. 354-402.000.
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Shindo, Noboru, to Murata Kikai Kabushiki Kaisha. Belt-operated false-twisting unit. 4,442,663, Cl. 57-336.000.
Shinmi, Akira: *See—*
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Shinno, Kiyonori, to Kabushiki Kaisha Nihon Plant Service Center. Method for lining the inner surface of a reduced pipe line. 4,443,498, Cl. 427-235.000.
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Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,443,598, Cl. 544-90.000.
Shoji, Masakazu: *See—*
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Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See—*
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Kosugi, Seiji, 4,442,864, Cl. 137-625.270.
Shuey, John R.: *See—*
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Shugarman, Alvin E.: *See—*
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Shugarman, Lynn E.; Shugarman, Alvin E.; and Rothman, Michael G., to Recon Ltd. Oil reclamation device. 4,443,334, Cl. 210-168.000.
Shuskus, Alexander J.: *See—*
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Shutt, Thomas C.; and Snider, L. Wayne. Method for producing glass particles in moisture protected condition. 4,443,240, Cl. 65-21.100.
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Sie, Swan T.: *See—*
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Siegell, Jeffrey H., to Exxon Research and Engineering Co. Continuous chromatographic separations in a magnetically stabilized fluidized bed. 4,443,231, Cl. 55-3.000.
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Ertl, Wilhelm; Lachmann, Ulrich; and Pertsch, Heinrich, 4,443,275, Cl. 148-31.550.
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Kopetzky, Horst, 4,443,669, Cl. 179-175.20C.
Krause, Dieter, 4,443,020, Cl. 279-1.0DA.
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Muller, Jorg, 4,443,796, Cl. 343-5.0PD.
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Simmons, Carlton J., Jr.; and Uetrecht, Dale M., to Baldwin Piano & Organ Company. Electronic organ having an improved tone generator system. 4,442,746, Cl. 84-1.010.
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Weisz, William; and Tyburcy, Raymond S., 4,442,784, Cl. 112-158.00C.
Singer, Laura G. Moisture and consistency soil sampler. 4,442,721, Cl. 73-863.310.
Sivachenko, Eugene W. Girder construction. 4,442,650, Cl. 52-694.000.
Skeist, S. Merrill: *See—*
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Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,443,210, Cl. 474-199.000.
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Skillern, Scott D. Method and composition for treatment of acne vulgaris. 4,443,442, Cl. 424-246.000.
Skudera, Jr. William J.: *See—*
Klose, Dirk R.; and Skudera, Jr. William J., 4,443,801, Cl. 343-442.000.
Skwarek, Jean-Pierre: *See—*
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Slater, Billy R., to Forney Engineering Company. Combined mode supervisory program-panel controller method and apparatus for a process control system. 4,443,861, Cl. 364-900.000.
Sloan, Jack: *See—*
Wilensky, Joseph, 4,442,675, Cl. 60-654.000.
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Smale, Terence C., to Beecham Group p.l.c. 8-Oxo-3-oxa-1-azabicyclo[4.2.0]octanes containing a chiral center. 4,443,599, Cl. 544-90.000.
Smallegan, Jon M., to Multifastener Corporation. Nut installation apparatus, method and controls. 4,442,584, Cl. 29-432.000.
Smick, Donald E.: *See—*
Modur, Bhaskar S.; Perl, Uwe W.; and Smick, Donald E., 4,443,177, Cl. 425-543.000.
Smiesko, Frank A.: *See—*
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Smith, Alfred H., Jr.: *See—*
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Smith, Burl L.; and Kearby, Ronald S., to Teepak, Inc. Food casing which will transfer a smoke color and flavor to food encased therein and basic natural liquid smoke for use therewith. 4,442,868, Cl. 138-118.100.
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Smith, Donald R. Wind rotor thrust-actuated brake. 4,443,155, Cl. 416-32.000.
Smith, Francis X.; and Riedhammer, Thomas M., to Bausch & Lomb Incorporated. Contact lens disinfecting and preserving solution (polymeric). 4,443,429, Cl. 424-78.000.
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Smith, James G., to Du Pont de Nemours, E. I., and Company. Sterile docking process, apparatus and system. 4,443,215, Cl. 604-29.000.
Smith, Kimberly M.: *See—*
Gronbeck, Peter W.; Mullaney, Dennis; and Smith, Kimberly M., 4,442,920, Cl. 182-199.000.
Smith Kline & French Laboratories Limited: *See—*
Hills, Derek W.; and White, George R., 4,443,375, Cl. 260-245.600.
Smith, Lawrence A., Jr., to Chemical Research & Licensing Company. Catalytic distillation structure. 4,443,559, Cl. 502-527.000.
Smith, Leward N. Sharpener for industrial knife blades. 4,442,635, Cl. 51-56.00R.
Smith, Lowell S.: *See—*
Brisken, Axel F.; and Smith, Lowell S., 4,442,715, Cl. 73-626.000.
Smith, Maurice R.: *See—*
Moore, Sanders H.; and Smith, Maurice R., 4,443,307, Cl. 204-98.000.
Smith, Richard, to West Point Pepperell, Inc. Method for making carbamates. 4,443,622, Cl. 560-166.000.
Smith, Rodger L.: *See—*
Godfrey, Timothy D.; and Smith, Rodger L., 4,443,831, Cl. 362-80.000.

Smith, Stephen N., to Ampro Corporation. Pole vaulter's landing cushion. 4,443,009, Cl. 272-104.000.

Smith, Teddy D.: *See*—
Hollifield, Charles M.; and Smith, Teddy D., 4,443,421, Cl. 423-321.00R.

Smith, Terry M., to Ford Aerospace & Communications Corporation. Modified difference mode coaxial antenna with flared aperture. 4,443,804, Cl. 343-786.000.

Smith, Thomas M. Heating of webs. 4,443,185, Cl. 432-59.000.

Smithers, Michael J.: *See*—
Davies, David H.; and Smithers, Michael J., 4,443,471, Cl. 424-279.000.

SMS Schloemann-Siemag Aktiengesellschaft: *See*—
Fusser, Hermann; Groos, Horst; and Schmoll, Heinz, 4,442,694, Cl. 72-453.010.

SNIA Viscosa S.p.A.: *See*—
Isome, Yasuo; Minami, Toshio; and Takahashi, Tadahiko, 4,443,596, Cl. 536-60.000.

Snider, Hugh H., Jr.; and Marion, Richard A., to United States of America, Navy. Roller bearing hot box sensor. 4,443,119, Cl. 374-153.000.

Snider, L. Wayne: *See*—
Shutt, Thomas C.; and Snider, L. Wayne, 4,443,240, Cl. 65-21.100.

Snoy, Joseph B., to Twin Disc, Incorporated. Vehicle transmission system and a single lever control device therefor. 4,442,730, Cl. 74-475.000.

Snyder, Carl E., Jr.; and Tamborski, Christ, to United States of America, Air Force. Fluorinated aliphatic polyalkylether lubricant with an additive composed of an aromatic phosphine substituted with perfluoroalkylether groups. 4,443,349, Cl. 252-49.900.

Snyder, Nevin: *See*—
Roth, William F.; and Snyder, Nevin, 4,443,285, Cl. 156-215.000.

Societe Anonyme dite Compagnie Europeene d'Accumulateurs: *See*—
Dalibard, Gerard; and Viaud, Nicole, 4,443,405, Cl. 420-573.000.

Societe de Vente de l'Aluminium Pechiney: *See*—
Hicter, Jean-Marie; Le Scoul, Thierry; and Mairet, Serge, 4,443,004, Cl. 266-226.000.

Societe Generale de Mecanique et de Metallurgie: *See*—
Chanton, Edmond, 4,443,165, Cl. 418-48.000.

Societe Nationale d'Etude et de Construction de Moteurs D'Aviation "S.N.E.C.M.A.": *See*—
Legrand, Paul J.; and Hersen, Rene M. J., 4,442,987, Cl. 244-110.00B.

Societe Nationale Elf Aquitaine (Production): *See*—
Arretz, Emmanuel; Landoussy, Claude; Mirassou, Alfred; and Ollivier, Jean, 4,443,310, Cl. 204-158.00R.

Society dite: sophysa: *See*—
Marion, Bernard, 4,443,214, Cl. 604-9.000.

Sofranko, John A.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,644, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,645, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,646, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,647, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,648, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,443,649, Cl. 585-500.000.

Soll, Manfred: *See*—
Seidler, Helmut; Soll, Manfred; and Wunderlich, Klaus, 4,443,369, Cl. 260-131.000.

Solomon, Stanley J.: *See*—
Little, Roger G.; Wolfson, Robert G.; and Solomon, Stanley J., 4,443,488, Cl. 427-38.000.

Sony Corporation: *See*—
Arai, Kiyoshi, 4,443,121, Cl. 400-120.000.
Kato, Tetsuro, 4,443,821, Cl. 358-326.000.
Kishi, Yoshio; and Mine, Norichika, 4,442,985, Cl. 242-186.000.
Matsumoto, Hiroyuki; Abe, Motoaki; and Ando, Tetsuo, 4,443,886, Cl. 377-58.000.
Nakajima, Kaoru; Kobayashi, Kunio; and Hisagen, Yoshiaki, 4,443,490, Cl. 427-44.000.
Sakamoto, Hitoshi, 4,443,823, Cl. 360-77.000.

Sopp, Samuel W.; Lee, Leonard S.; and Howe, Michael W., to Calgon Corporation. Magnesium oxide composition for coating silicon steel. 4,443,425, Cl. 423-635.000.

Souquet, Georges A. L., representative: *See*—
Jourdain, Philippe; Florens, Georges E., deceased; and Souquet, Georges A. L., representative, 4,442,966, Cl. 228-123.000.

Spector, George: *See*—
Conn, George E.; and Spector, George, 4,442,933, Cl. 198-502.000.

Speich, Francisco; and Bucher, Robert, to Textilma AG. Apparatus for the optical retention of the two reciprocatingly driven control elements of the shed forming arrangement associated with a loom. 4,442,869, Cl. 139-71.000.

Spencer, Bob B., to Standard Pneumatic Motor Co., a Division of Hamilton Company. Automatic push-to-start screwdriver. 4,442,738, Cl. 81-470.000.

Speranza, Donald, to Eaton Corporation. Low power put timer circuit and the application thereof within a tire pressure monitor. 4,443,785, Cl. 340-58.000.

Sperry Corporation: *See*—
Adcock, Ralph L., 4,443,846, Cl. 364-200.000.
Jennings, Richard E., 4,442,662, Cl. 56-228.000.
Rubin, William L., 4,443,799, Cl. 343-17.2PC.

Spiess, Joachim: *See*—
Sherwood, Nancy M.; Eiden, Lee E.; Brownstein, Michael J.; Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,443,368, Cl. 260-112.5LH.

Spiess, Karl-Heinz: *See*—
Becker, Josef; Simon, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,443,392, Cl. 264-25.000.

Spinetti, Thomas A.: *See*—
Armstrong, Errol C.; Hanacek, William A.; and Spinetti, Thomas A., 4,443,151, Cl. 414-404.000.

Spire Corporation: *See*—
Little, Roger G.; Wolfson, Robert G.; and Solomon, Stanley J., 4,443,488, Cl. 427-38.000.

Sporlan Valve Company: *See*—
Barbier, William J.; and Leimbach, J. George, 4,442,680, Cl. 62-217.000.

Sprague Electric Company: *See*—
Avery, Grant D., 4,443,716, Cl. 307-309.000.

Springford, Richard H.: *See*—
Minter, Thomas F.; Jansen, Lawrence G.; and Springford, Richard H., 4,442,618, Cl. 40-587.000.

SRI International: *See*—
Crane, Hewitt D., 4,443,075, Cl. 351-209.000.
Wilson, David A.; and Buxton, James L., 4,442,713, Cl. 73-599.000.

Stachitas, Bruce L. Method of externally sealing sewage system joints against entry of ground water to the system. 4,443,282, Cl. 156-152.000.

Stadheim, James S. Vent pipe insulating sleeve. 4,442,643, Cl. 52-219.000.

Stafford, Donald C.; Shah, Tushar K.; and Allo, Vincent F., to Chicago Bridge & Iron Company. Vertical shell and tube heat exchanger with sleeves around upper part of tubes. 4,442,679, Cl. 62-123.000.

Stageberg, Sterling O., deceased; and Linney, Edward A., legal representative. Rotary fluid pump mechanism. 4,443,167, Cl. 418-91.000.

Standard Oil Company, The: *See*—
Callahan, James L.; Shaw, Wilfrid G.; and Miller, Arthur F., 4,443,555, Cl. 502-211.000.
Crowell, Ronald F., 4,442,897, Cl. 166-280.000.

Standard Oil Company (Indiana): *See*—
Lee, Richard J., 4,443,604, Cl. 544-399.000.
Pesa, Frederick A.; Graham, Anne M.; and Kliewer, Wayne R., 4,443,639, Cl. 568-885 000.

Standard Pneumatic Motor Co., a Division of Hamilton Company: *See*—
Spencer, Bob B., 4,442,738, Cl. 81-470.000.

Standley, Paul M., to Dayco Corporation. Method of making an endless power transmission belt. 4,443,280, Cl. 156-137.000.

Starnes, William H., Jr., to Bell Telephone Laboratories, Incorporated. Technique for stabilization of vinyl chloride polymers. 4,443,586, Cl. 525-370.000.

Stas, Georges; and Biver, Christian, to INTEROX (Societe Anonyme). Treatment of waste water containing organic sulphur compounds. 4,443,342, Cl. 210-759.000.

Stauffer Chemical Company: *See*—
Dahlstrom, Robert V., 4,443,484, Cl. 426-266.000.

Stearns, Cleo M.: *See*—
Wanuga, Stephen; Kong, Wendell M. T.; and Stearns, Cleo M., 4,442,574, Cl. 29-25.350.

Steel, James, to Ogden Electronics Ltd. Vehicle control apparatus. 4,442,915, Cl. 180-271.000.

Steelstran Industries, Incorporated: *See*—
Gronbeck, Peter W.; Mullaney, Dennis; and Smith, Kimberly M., 4,442,920, Cl. 182-199.000.

Steenberg, Johannes, to U.S. Philips Corporation. Information-disc cassette. 4,443,874, Cl. 369-291.000.

Steenbock, Arno, to Preussag Aktiengesellschaft. Tool for drilling curved sections of well holes. 4,442,908, Cl. 175-74.000.

Steffler, Jean C.: *See*—
Samson, J. E. Benoit; Duncan, Lawrence W.; and Steffler, Jean C., 4,442,838, Cl. 128-369.000.

Stegmeier, Karlheinz: *See*—
Witte, Ernst-Christian; Wolfe, Hans P.; Stegmeier, Karlheinz; and Roesch, Egon, 4,443,477, Cl. 424-319.000.

Stellaccio, Robert J., to Texaco Inc. Partial oxidation process for slurries of solid fuel. 4,443,230, Cl. 48-197.00R.

Stemerman, Michael B.; Weinstein, Robert; and Maciag, Thomas, to Beth Israel Hospital Association, The. Process and composition for propagating mammalian cells. 4,443,546, Cl. 435-240.000.

Stenert, Alois: *See*—
Ketschker, Walter; Marquart, Reinhard; and Stenert, Alois, 4,443,045, Cl. 308-223.000.

Stephens, Frederick R. N. Pulse curve analyser. 4,442,845, Cl. 128-687.000.

Stern, Richard M.: *See*—
Gerster, John F.; and Stern, Richard M., 4,443,447, Cl. 424-248.530.

Sternisa, Danilo; and Kistner, Herbert, to Upat GmbH & Co. Single-component hardenable synthetic resin composition and method of using same. 4,443,567, Cl. 523-211.000.

Stockton, Ronald J.; and Munson, Robert E., to Ball Corporation. Monolithic microwave integrated circuit with integral array antenna. 4,442,590, Cl. 29-571.000.

Stott, Michael A.: *See*—
Reichert, James K.; and Stott, Michael A., 4,443,767, Cl. 328-155.000.

Stotz, Gerhard; Sedlak, Adolf; and Skwarek, Jean-Pierre, to Timex Corporation. Planetary gear for date mechanism in a wristwatch. 4,443,112, Cl. 368-37.000.

Strabag Bau-AG: *See—*
Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, 4,443,132, Cl. 405-260.000.

Strata Bit Corporation: *See—*
Radtke, Robert P., 4,442,909, Cl. 175-329.000.

Straub, Richard L.: *See—*
Pou, Frederick M.; and Straub, Richard L., 4,442,774, Cl. 101-226.000.

Streibert, Hans-Peter: *See—*
Farooq, Saleem; and Streibert, Hans-Peter, 4,443,445, Cl. 424-246.000.

Streitenberger, Walter: *See—*
Achinger, Michael; Streitenberger, Walter; Voigt, Otto K. H.; and Wolter, Hans, 4,442,882, Cl. 164-187.000.

Strix Limited: *See—*
Taylor, John C., 4,443,050, Cl. 339-99.00R.

Stroetmann, Michael, to Serapharm Michael Stroetmann. Fibrinogen-containing dry preparation, manufacture and use thereof. 4,442,655, Cl. 53-428.000.

Strohmeyer, Charles, Jr., to Electrodyne Research Corporation. Recirculating fluidized bed combustion system for a steam generator. 4,442,795, Cl. 122-4.00D.

Strohmeyer, Charles, Jr., to Electrodyne Research Corporation. Migrating fluidized bed combustion system for a steam generator. 4,442,796, Cl. 122-4.00D.

Strohmeyer, Charles, Jr., to Electrodyne Research Corporation. Gas and particle separation means for a steam generator circulating fluidized bed firing system. 4,442,797, Cl. 122-4.00D.

Stromberg-Carlson Corporation: *See—*
Ellis, Thomas E.; Lenk, Pedro A.; and Shah, Jayantkumar R., 4,443,663, Cl. 179-18.0ES.

Strow, Donald A.; and Henning, Harold I. G., to Envirex Inc. Water screening clamp strip. 4,443,126, Cl. 403-24.000.

Struck, Bernd D., to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Electrolysis cell with intermediate chamber for electrolyte flow. 4,443,316, Cl. 204-263.000.

Struthers, Ralph C. Metal/acid ion permeable membrane fuel cell. 4,443,522, Cl. 429-18.000.

Stuart, Clifford H. Lawn mower pump. 4,442,661, Cl. 56-16.900.

Studt, William L.: *See—*
Douglas, George H.; Studt, William L.; Dodson, Stuart A.; and Zimmerman, Harry K., 4,443,456, Cl. 424-263.000.

Subramanyam, Arty R. T.: *See—*
Schroder, Manfred; and Subramanyam, Arty R. T., 4,443,569, Cl. 523-414.000.

Suenaga, Masahide; Tsukada, Yukihisa; and Yamamoto, Hiroshi, to Hitachi, Ltd. Process for forming magnetic film pattern. 4,443,294, Cl. 156-656.000.

Sugarman, Edward D.; and Brownlie, Alan W., to Sugarman, Edward D. Foot support device. 4,443,005, Cl. 269-328.000.

Sugimoto, Naohiko: *See—*
Kojima, Tetsuro; Ishimaru, Shingo; Sugimoto, Naohiko; and Ikeda, Tadashi, 4,443,534, Cl. 430-512.000.

Suh, Nam P.; and Tse, Ming K., to Massachusetts Institute of Technology. Method for non-destructive detection and characterization of flaws. 4,443,764, Cl. 324-456.000.

Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Heat-resistant and corrosion-resistant weld metal alloy and welded structure. 4,443,406, Cl. 420-584.000.

Sullair Technology AB: *See—*
Schibbye, Lars L. B.; and Englund, Rolf A., 4,443,170, Cl. 418-203.000.

Sullivan, Ann C.: *See—*
Guthrie, Robert W.; Kierstead, Richard W.; Mennona, Francis A.; and Sullivan, Ann C., 4,443,619, Cl. 549-518.000.

Sullivan, Edith. Retroreflective dangles. 4,443,056, Cl. 350-98.000.

Sulzer Brothers Limited: *See—*
Jankovsky, Frantisek, 4,442,870, Cl. 139-185.000.

Sumitomo Aluminium Smelting Company, Ltd.: *See—*
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 4,442,829, Cl. 126-452.000.

Sumitomo Chemical Company, Limited: *See—*
Kasamatsu, Kiyoshi; Hirano, Masachika; and Okuno, Takeshi, 4,443,438, Cl. 424-200.000.

Sumitomo Heavy Industries, Ltd.: *See—*
Ikegami, Shigeru; and Ohsaki, Takashi, 4,443,726, Cl. 310-248.000.

Sunahara, Noriyuki; Naruto, Shunsuke; Kagemoto, Akira; Kurooka, Shigeru; and Yokogawa, Kanae, to Dainippon Pharmaceutical Company Limited. Method for determination of the valproic acid and reagents therein. 4,443,365, Cl. 260-112.00R.

Sunbeam Plastics Corporation: *See—*
Bush, Randall G., 4,442,955, Cl. 222-153.000.

Sunouchi, Akio; Konno, Tatsuo; Fujino, Masahisa; and Suzuki, Ryuji, to Canon Kabushiki Kaisha. Film winding and rewinding device for camera. 4,443,089, Cl. 354-214.000.

Supreme Associates: *See—*
Helman, Edward R.; Helman, Herbert A.; Holtschneider, Henry B.; Buford, Sidney P.; Fava, Donald C.; and Christopher, Jeffrey N., 4,442,827, Cl. 126-430.000.

Suzuki, Akira: *See—*
Murata, Moriyasu; Suzuki, Akira; Nakae, Atsuo; and Ito, Susumu, 4,443,355, Cl. 252-174.120.

Suzuki, Fuminori: *See—*
Yoshida, Makoto; Watanabe, Shinichi; and Suzuki, Fuminori, 4,443,116, Cl. 368-202.000.

Suzuki, Hajime; Umemura, Yoshifumi; Iwano, Yoshimi; and Kimbara, Masahiko, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Weft yarn guide for a fluid jet loom. 4,442,871, Cl. 139-435.000.

Suzuki, Masakazu: *See—*
Ikeda, Toshiaki; Furuichi, Shuhei; and Suzuki, Masakazu, 4,443,843, Cl. 363-59.000.

Suzuki, Ryuji: *See—*
Sunouchi, Akio; Konno, Tatsuo; Fujino, Masahisa; and Suzuki, Ryuji, 4,443,089, Cl. 354-214.000.

Suzuki, Takashi, to Canon Kabushiki Kaisha. Metering device of a single lens reflex camera. 4,443,081, Cl. 354-479.000.

Suzuki, Toshitatsu: *See—*
Murano, Tamio; Yamane, Satoshi; Suzuki, Toshitatsu; and Fukushima, Yoshio, 4,443,082, Cl. 354-145.100.

Swanson, Richard G.: *See—*
Swanson, Sven V., Jr.; and Swanson, Richard G., 4,442,739, Cl. 82-2.500.

Swanson, Sven V., Jr.; and Swanson, Richard G., to Litton Industrial Products, Inc. Multi-spindle work transfer device. 4,442,739, Cl. 82-2.500.

Swapceinski, John P.; Rose, Leon A.; Probst, Stewart D.; McKeown, Donald G.; and Hilbert, Thomas K., to Eastman Kodak Company. Magnetic brush development apparatus. 4,442,790, Cl. 118-657.000.

Swartz, George A., to RCA Corporation. Series connected solar cells on a single substrate. 4,443,651, Cl. 136-249.000.

Swarz, Richard L., to Protocol Computers, Inc. Data line interface. 4,443,884, Cl. 375-121.000.

Swearingen, Judson S. Viscosity meter. 4,442,704, Cl. 73-55.000.

Swessel, Michael A.: *See—*
Hahn, Norbert; Hipp, Steven J.; and Swessel, Michael A., 4,443,150, Cl. 414-401.000.

Swift, David E.: *See—*
Maurer, Donald D.; Swift, David E.; and Ioffe, Zosim, 4,442,839, Cl. 128-419.00R.

Swoboda, Carl A., to United States of America, Energy. Ultrasonic hydrometer. 4,442,700, Cl. 73-32.00A.

Systron Donner Corp.: *See—*
Magorien, Vincent G., 4,442,863, Cl. 137-614.030.

Szanto, Elmer G., to Velo-Bind Inc. Punching machine. 4,442,743, Cl. 83-372.000.

Tabata, Junichi: *See—*
Kaneko, Noboru; and Tabata, Junichi, 4,443,115, Cl. 368-82.000.

Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Solid-state color imager with two layer three story structure. 4,443,813, Cl. 358-44.000.

Taboada, John. Optical beam intensity control system. 4,443,696, Cl. 250-205.000.

Tabuchi, Takahisa: *See—*
Asari, Akira; Noyori, Tatsuhiko; Tsuzuki, Hidehiro; Tabuchi, Takahisa; Masuda, Tsuneharu; and Takehata, Tetsuro, deceased, 4,443,143, Cl. 409-295.000.

Taiho Pharmaceutical Co., Ltd.: *See—*
Senda, Shigeo; Ohtani, Osamu; Katho, Eiichi; Nagasaka, Mitsuaki; Miyake, Hidekazu; Fujiwara, Khosuke; and Tanaka, Motoaki, 4,443,607, Cl. 546-141.000.

Takagi, Hiroshi: *See—*
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,443,826, Cl. 360-113.000.

Takagi, Toshinori; and Matsubara, Kakuei, to Kyoto University. Thermoelectric converter element. 4,443,650, Cl. 136-211.000.

Takahashi, Kenji: *See—*
Ohba, Shinya; Nakai, Masaaki; Ozaki, Toshifumi; and Takahashi, Kenji, 4,443,818, Cl. 358-213.000.

Takahashi, Masanobu, to Bridgestone Tire Company, Ltd. Heavy duty pneumatic tires. 4,442,880, Cl. 152-356.00R.

Takahashi, Tadahiko: *See—*
Isome, Yasuo; Minami, Toshio; and Takahashi, Tadahiko, 4,443,596, Cl. 536-60.000.

Takahashi, Yasuki: *See—*
Miyakawa, Hideaki; Takahashi, Yasuki; and Hata, Fumio, 4,443,090, Cl. 354-289.120.

Takamatsu, Toshiaki: *See—*
Funada, Fumiaki; Takamatsu, Toshiaki; and Wada, Tomio, 4,443,819, Cl. 358-236.000.

Takamori, Kazuo: *See—*
Seino, Akira; Takamori, Kazuo; and Morinaga, Kaoru, 4,443,745, Cl. 318-461.000.

Takao, Mitsunori: *See—*
Mizuno, Toshiaki; and Takao, Mitsunori, 4,442,812, Cl. 123-417.000.

Takashige, Masao; Kaneda, Kazuhisa; and Murakami, Naotaka, to Idemitsu Petrochemical Co., Ltd. Method of producing biaxially oriented sheet or film and apparatus therefor. 4,443,399, Cl. 264-519.000.

Takasugi, Hisashi: *See—*
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,443,444, Cl. 424-246.000.

Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,443,444, Cl. 424-246.000.

Takeda Chemical Industries, Inc.: *See*—
Kamatani, Yoshio; and Fujita, Noriaki, 4,443,597, Cl. 544-67.000.
Takeda Chemical Industries, Ltd.: *See*—
Kamatani, Yoshio; Tanaka, Michio; and Yamazaki, Kyuya, 4,443,590, Cl. 528-51.000.
Kawamatsu, Yutaka; Saraie, Takahiro; and Yoshikawa, Harutoshi, 4,443,246, Cl. 71-94.000.
Takehata, Akemi, legal representative: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tsuzuki, Hidehiro; Tabuchi, Takahisa; Masuda, Tsuneharu; and Takehata, Tetsuro, deceased, 4,443,143, Cl. 409-295.000.
Takehata, Tetsuro, deceased: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tsuzuki, Hidehiro; Tabuchi, Takahisa; Masuda, Tsuneharu; and Takehata, Tetsuro, deceased, 4,443,143, Cl. 409-295.000.
Takemae, Yoshihiro, to Fujitsu Limited. Bootstrap circuit. 4,443,720, Cl. 307-578.000.
Takemae, Yoshihiro, to Fujitsu Limited. Semiconductor memory device. 4,443,868, Cl. 365-205.000.
Takemae, Yoshihiro: *See*—
Nakano, Tomio; and Takemae, Yoshihiro, 4,443,714, Cl. 307-269.000.
Takeuchi, Hirosato; and Mikiya, Toshio, to Nitto Kohki Co., Ltd. Portable type solar heat cooker assembly. 4,442,828, Cl. 126-451.000.
Taki, Tooru: *See*—
Hoshino, Minoru; Shinohara, Tosio; Tanabe, Hiroyuki; Taki, Tooru; and Nakayama, Shunsuke, 4,443,503, Cl. 427-421.000.
Takimoto, Masatami: *See*—
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, 4,443,388, Cl. 261-39.00A.
Talmon, Wolfgang: *See*—
Dworak, Wilhelm; Fader, Martin; Jons, Claus; Mayer, Siegfried; Muller, Karl-Heinz; Rasper, Manfred; Schuldt, Dietrich; Talmon, Wolfgang; and Wolff, Guenter, 4,443,168, Cl. 418-131.000.
Talon, Inc.: *See*—
Moertel, George B., 4,442,583, Cl. 29-408.000.
Tamborski, Christ: *See*—
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,443,349, Cl. 252-49.900.
Tamm, Rolf: *See*—
Huber, Bernhard; Tamm, Rolf; and Tomoff, Toma, 4,443,105, Cl. 356-312.000.
Tamura, Shinichi; Seta, Toshio; Tanaka, Tsuneo; and Hikosaka, Mititika, to Toyo Ink Manufacturing Co., Ltd. Photoconductive materials comprising nitro or cyano substituted phthalocyanine compounds for electrophotography. 4,443,528, Cl. 430-56.000.
Tanabe, Hiroyuki: *See*—
Hoshino, Minoru; Shinohara, Tosio; Tanabe, Hiroyuki; Taki, Tooru; and Nakayama, Shunsuke, 4,443,503, Cl. 427-421.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Matsuoka, Manabu; Tsuchiya, Michihiro; and Tokuda, Yoshikazu, 4,443,615, Cl. 548-489.000.
Samejima, Masayoshi; and Hirata, Goichi, 4,443,497, Cl. 427-213.360.
Tanaka, Hideo: *See*—
Ishido, Yoshinobu; and Tanaka, Hideo, 4,443,019, Cl. 277-227.000.
Tanaka, Katsuyuki; Ohashi, Shin-ichi; Saito, Masakatsu; and Sampei, Tohru, to Hitachi, Ltd. Drive circuit for electroluminescent element. 4,443,741, Cl. 315-307.000.
Tanaka, Kazuo: *See*—
Niwa, Yukichi; Ogino, Yasuo; Ohwada, Mitsutoshi; Tanaka, Kazuo; and Koumura, Noboru, 4,443,078, Cl. 354-403.000.
Tanaka, Masamichi; and Wada, Hiroto, to Tokyo Shibaura Denki Kabushiki Kaisha. Electret device. 4,443,711, Cl. 307-400.000.
Tanaka, Michio: *See*—
Kamatani, Yoshio; Tanaka, Michio; and Yamazaki, Kyuya, 4,443,590, Cl. 528-51.000.
Tanaka, Minoru: *See*—
Sawada, Susumu; Yoshida, Yoshikazu; and Tanaka, Minoru, 4,443,288, Cl. 156-304.600.
Tanaka, Motoaki: *See*—
Senda, Shigeo; Ohtani, Osamu; Katho, Eiichi; Nagasaka, Mitsuaki; Miyake, Hidekazu; Fujiwara, Khosuke; and Tanaka, Motoaki, 4,443,607, Cl. 546-141.000.
Tanaka, Takayuki: *See*—
Yamada, Kozo; and Tanaka, Takayuki, 4,443,507, Cl. 428-114.000.
Tanaka, Tsuneo: *See*—
Tamura, Shinichi; Seta, Toshio; Tanaka, Tsuneo; and Hikosaka, Mititika, 4,443,528, Cl. 430-56.000.
Tandy Corporation: *See*—
Berger, Michael F., 4,443,883, Cl. 375-116.000.
Tanida, Wasaburo: *See*—
Miyamoto, Yoshikazu; Kakimoto, Tetsuya; and Tanida, Wasaburo, 4,442,953, Cl. 222-14.000.
Tanikawa, Kowji, to Olympus Optical Co., Ltd. Film cassette and a photographing device using the same. 4,443,077, Cl. 354-21.000.
Tate & Lyle Public Limited Company: *See*—
Cheetham, Peter S. J., 4,443,538, Cl. 435-41.000.
Tatem, William A., to Interpace Corporation. Glaze to pin connection for an electrical insulator with embedded metal fitting. 4,443,659, Cl. 174-140.00C.
Taylor, Dennis R.; and Demidowicz, Zenon, to Harshaw/Filtrol Partnership. Solid bleaching composition for edible oils. 4,443,379, Cl. 260-427.000.
Taylor, Donald K., to C.S.E. Automation Engineering & Services, Inc. Pilot control relay valve apparatus. 4,442,860, Cl. 137-557.000.
Taylor, John C., to Strix Limited. Electrical interconnectors. 4,443,050, Cl. 339-99.00R.
Taylor, Kenneth A.: *See*—
Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., 4,442,701, Cl. 73-32.00R.
TDK Electronics Co., Ltd.: *See*—
Kawashima, Yukio; Kobayashi, Makoto; and Murakami, Mayu, 4,443,317, Cl. 204-290.00F.
Teepak, Inc.: *See*—
Smith, Burl L.; and Kearby, Ronald S., 4,442,868, Cl. 138-118.100.
TekSonix, Inc.: *See*—
Jubenville, Duncan B., 4,443,322, Cl. 208-11.0LE.
Teldix GmbH: *See*—
Auer, Werner, 4,442,723, Cl. 74-5.470.
Teledyne Industries, Inc.: *See*—
Trenary, John M., 4,442,831, Cl. 128-66.000.
Teledyne Republic Manufacturing: *See*—
O'Connor, Terence A., 4,443,162, Cl. 417-425.000.
Tempmaster Corporation: *See*—
Dean, Raymond H.; and Bader, Ghassan, 4,442,760, Cl. 98-40.00D.
Tenax Maskin AB: *See*—
Nordqvist, Sune, 4,443,261, Cl. 106-109.000.
Teng, Chuan C., to Dailey, Inc. Well tool. 4,443,206, Cl. 464-20.000.
Tenud, Leander; and Blum, Rene, to Lonza Ltd. Process for the production of carnitine amide. 4,443,627, Cl. 564-136.000.
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, to Toyota Jidosha Kabushiki Kaisha; and Aisan Industry Co., Ltd. Device for adjusting the degree of opening of the throttle valve of a carburetor. 4,443,388, Cl. 261-39.00A.
Terumo Corporation: *See*—
Muramoto, Yutaka; Kobayashi, Susumu; and Ishizaka, Hideo, 4,443,117, Cl. 374-1.000.
Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,443,617, Cl. 549-302.000.
Texaco Inc.: *See*—
Lionetti, Thomas A.; and MacLean, John P., 4,443,551, Cl. 502-41.000.
Schlinger, Warren G., 4,443,228, Cl. 48-86.00R.
Stellaccio, Robert J., 4,443,230, Cl. 48-197.00R.
Texas Instruments Incorporated: *See*—
Haken, Roger A., 4,442,591, Cl. 29-571.000.
Hamilton, Stephen P.; and Hunter, Arthur C., 4,443,845, Cl. 364-200.000.
McElroy, David J., 4,443,864, Cl. 364-900.000.
Sahay, Bharat B.; and Jones, James J., 4,442,972, Cl. 236-1.0EA.
Sanford, Robert F., 4,443,694, Cl. 235-465.000.
Tubbs, Graham S.; and Ponder, James E., 4,443,811, Cl. 357-42.000.
Wiggins, Richard H., 4,443,859, Cl. 364-724.000.
Textilma AG: *See*—
Speich, Francisco; and Bucher, Robert, 4,442,869, Cl. 139-71.000.
Thakur, Madhukar L., to Yale University. Blood agent. 4,443,426, Cl. 424-1.100.
Theiler, Richard F.: *See*—
Sato, Kunito; and Theiler, Richard F., 4,443,483, Cl. 426-266.000.
Theze, Claude: *See*—
Laurent, Daniel M.; and Theze, Claude, 4,442,988, Cl. 246-34.0CT.
Thiele, Kurt: *See*—
Mixich, Georg; and Thiele, Kurt, 4,443,612, Cl. 548-341.000.
Tholen, Paul, to Klockner-Humboldt-Deutz Aktiengesellschaft. Light metal cylinder head for internal combustion engines. 4,442,803, Cl. 123-41.690.
Thomas & Betts Corporation: *See*—
Narozny, Ronald S., 4,442,594, Cl. 29-884.000.
Thomas Broadbent & Sons Limited: *See*—
Grimwood, Geoffrey L.; and Wright, John, 4,443,213, Cl. 494-38.000.
Thomas, Patrick D. P.: *See*—
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,443,537, Cl. 430-566.000.
Thomson-CSF: *See*—
Albarello, Alain, 4,443,857, Cl. 364-513.500.
Eumurian, Gregoire, 4,443,890, Cl. 455-613.000.
THORN EMI plc: *See*—
Roy, Ashutosh, 4,443,738, Cl. 313-491.000.
Thorp, Benjamin A. Controlled turbulence hydrofoil blade support member. 4,443,298, Cl. 162-252.000.
Thurer, Robert L.: *See*—
Hauer, Jerome M.; and Thurer, Robert L., 4,443,220, Cl. 604-408.000.
Thuries, Edmond, to Alsthom-Atlantique. Current transformer. 4,443,779, Cl. 336-92.000.
Thut, Robert S.: *See*—
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,297, Cl. 162-101.000.
Cheshire, James O.; Lindgren, Douglas L.; Marinack, Robert J.; Janda, Bruce W.; Thut, Robert S.; Larkey, John T.; and Jostad, Ray E., 4,443,299, Cl. 162-264.000.
Thyssen-Bornemisza Inc.: *See*—
Borsh, Richard J.; Neff, Steven W.; and Pate, Harold T., 4,443,031, Cl. 285-419.000.

Tickner, Ernest G.: *See*—
Rasor, Julia S.; and Tickner, Ernest G., 4,442,843, Cl. 128-660.000.
Tillmanns, Ralf: *See*—
Hill, Ronald A.; Tillmanns, Ralf; and Sieberling, Bernd, 4,443,657, Cl. 174-110.0FC.
Timex Corporation: *See*—
Stotz, Gerhard; Sedlak, Adolf; and Skwarek, Jean-Pierre, 4,443,112, Cl. 368-37.000.
Timmerman, Terry D.: *See*—
True, Martin E.; and Timmerman, Terry D., 4,442,736, Cl. 81-57.150.
Tobias, Michael A., to Mobil Oil Corporation. Acrylic modified anionic water dispersible cellulose esters. 4,443,589, Cl. 527-300.000.
Tobita, Yoshimitsu: *See*—
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.
Tobolski, Edward L.: *See*—
Lang, Elliot R.; and Tobolski, Edward L., 4,442,705, Cl. 73-83.000.
Tochimori, Kenichi: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.
Togashi, Seigo; Tsuzuki, Akira; and Fujita, Hiro, to Citizen Watch Company Limited. Multi-layer display device with nonactive display element groups. 4,443,062, Cl. 350-332.000.
Toho Beslon Co., Ltd.: *See*—
Ikegami, Shigeru; and Ohsaki, Takashi, 4,443,726, Cl. 310-248.000.
Yamada, Kozo; and Tanaka, Takayuki, 4,443,507, Cl. 428-114.000.
Toho Sheet Frame Co., Ltd.: *See*—
Nakazawa, Hiroshi; and Kuji, Makoto, 4,442,951, Cl. 220-319.000.
Tojo, Kenji: *See*—
Ikegawa, Masato; Tojo, Kenji; and Shiibayashi, Masao, 4,443,166, Cl. 418-55.000.
Tojza, Roman A.: *See*—
Hooker, Donald E.; and Tojza, Roman A., 4,443,209, Cl. 474-94.000.
Tokico Ltd.: *See*—
Miyamoto, Yoshikazu; Kakimoto, Tetsuya; and Tanida, Wasaburo, 4,442,953, Cl. 222-14.000.
Tokiko Kabushiki Kaisha: *See*—
Muto, Toshiaki, 4,442,926, Cl. 188-317.000.
Toku Kabushiki Kaisha: *See*—
Koike, Tsutomu, 4,443,777, Cl. 336-65.000.
Tokuda, Tetsuro: *See*—
Fujitani, Hidetsugu; Ishigaki, Tsuneo; and Tokuda, Tetsuro, 4,443,775, Cl. 335-281.000.
Tokuda, Yoshikazu: *See*—
Matsuoka, Manabu; Tsuchiya, Michihiro; and Tokuda, Yoshikazu, 4,443,615, Cl. 548-489.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Ando, Hideo, 4,443,806, Cl. 346-135.100.
Gokita, Masami, 4,443,712, Cl. 307-140.000.
Kihara, Kazuo; and Ikeda, Masashi, 4,443,808, Cl. 357-15.000.
Mori, Leo; Aoba, Takashi; and Tominaga, Mamoru, 4,443,814, Cl. 358-60.000.
Onodera, Toshihiro; and Masuda, Youichi, 4,443,839, Cl. 363-20.000.
Sakata, Hirotsugu; Nagatomo, Shigemi; and Matsuzaka, Takashi, 4,442,682, Cl. 62-401.000.
Seino, Akira; Takamori, Kazuo; and Morinaga, Kaoru, 4,443,745, Cl. 318-461.000.
Tanaka, Masamichi; and Wada, Hiroto, 4,443,711, Cl. 307-400.000.
Yamaguchi, Ryoji, 4,443,043, Cl. 308-10.000.
Tomaiuolo, Francesco; and Bocchino, Mauro, to Alfachimici S.p.A. Stabilizing mixture for a chemical copper plating bath. 4,443,257, Cl. 106-1.230.
Tominaga, Mamoru: *See*—
Mori, Leo; Aoba, Takashi; and Tominaga, Mamoru, 4,443,814, Cl. 358-60.000.
Tomoff, Toma: *See*—
Huber, Bernhard; Tamm, Rolf; and Tomoff, Toma, 4,443,105, Cl. 356-312.000.
Tomori, Yasumasa; Shimoda, Mituhiko; and Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with an interchangeable lens. 4,443,085, Cl. 354-402.000.
Toray Industries, Inc.: *See*—
Fukuda, Tadanori; and Matsunaga, Tadayo, 4,443,588, Cl. 526-301.000.
Otani, Mitsunobu; Senda, Teruo; and Hirose, Michio, 4,443,337, Cl. 210-602.000.
Toray Silicone Company, Ltd.: *See*—
Shimizu, Hiroshi; Fukano, Yoshisama; and Yoshizawa, Minoru, 4,443,359, Cl. 252-358.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Fujita, Shigeru, 4,443,178, Cl. 425-564.000.
Toth, John E.: *See*—
Kirst, Herbert A.; and Toth, John E., 4,443,436, Cl. 424-180.000.
Toth, Tibor E., to Union Carbide Corporation. Method and system for automatically terminating a MIG welding operation. 4,443,687, Cl. 219-130.210.
Towmotor Corporation: *See*—
Johannson, Richard J., 4,442,922, Cl. 187-9.00E.
Toyo Engineering Corporation: *See*—
Sakurai, Masao; and Wada, Tetsuo, 4,443,328, Cl. 208-106.000.
Toyo Ink Manufacturing Co., Ltd.: *See*—
Tamura, Shinichi; Seta, Toshio; Tanaka, Tsuneo; and Hikosaka, Mititika, 4,443,528, Cl. 430-56.000.
Toyo Rubber Industry Co., Ltd., The: *See*—
Uemura, Yukihisa, 4,442,879, Cl. 152-209.00R.
Toyota, Hiromi: *See*—
Katoh, Hiroshi; Toyota, Hiromi; Koyama, Kazuo; and Komiya, Kunihiko, 4,443,272, Cl. 148-12.00C.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ina, Toshikazu; Kawai, Hisasi; Kohama, Tokio; Nishimatsu, Akira; Ishida, Yasuhiko; and Matsusita, Souichi, 4,442,820, Cl. 123-571.000.
Teramura, Mitsuyoshi; Takimoto, Masatami; Nakamura, Norihiko; Itoh, Takaaki; Katou, Takashi; Morino, Toshiharu; and Sakakibara, Youzou, 4,443,388, Cl. 261-39.00A.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Idogaki, Takaharu; Kawai, Hisasi; Hattori, Kyo; and Sakurai, Kazuhiro, 4,442,997, Cl. 251-129.000.
Nagase, Masaomi; Miyagi, Hideo; Ono, Hironobu; and Nakano, Jiro, 4,442,813, Cl. 123-418.000.
Nohira, Hidetaka; Ito, Sumio; and Oki, Hisashi, 4,442,809, Cl. 123-316.000.
Trans-Texas Energy, Inc.: *See*—
Wyatt, William G., 4,442,898, Cl. 166-303.000.
Tremont, Samuel J.; Keppel, Robert A.; Lee, Emerson H.; and Davis, George D., to Monsanto Company. Attrition resistant bismuth-containing metal/oxygen compositions. 4,443,641, Cl. 585-428.000.
Tremont, Samuel J.: *See*—
Keppel, Robert A.; Tremont, Samuel J.; Lee, Emerson H.; and Davis, George D., 4,443,642, Cl. 585-428.000.
Trenary, John M., to Teledyne Industries, Inc. On/off handle for oral hygiene apparatus. 4,442,831, Cl. 128-66.000.
Trenk, Hugh L.: *See*—
Schopf, Larry D.; Sakowicz, Jerome K.; and Trenk, Hugh L., 4,443,482, Cl. 426-106.000.
Tribe, David E.: *See*—
Rogers, Peter L.; and Tribe, David E., 4,443,543, Cl. 435-161.000.
Rogers, Peter L.; and Tribe, David E., 4,443,544, Cl. 435-162.000.
Tribotech: *See*—
Cain, Earl S.; Carlson, Jerome A.; and Barger, William L., 4,443,044, Cl. 384-428.000.
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Handricus B. A., to ACF Chemiefarma N.V. Quinoline derivatives, pharmaceutical compositions containing such compounds, and methods for treating cardiovascular conditions with them. 4,443,453, Cl. 424-258.000.
Triplett, James T. Floating crane stabilizer. 4,442,943, Cl. 212-192.000.
True, Martin E.; and Timmerman, Terry D., to Weatherford/Lamb, Inc. Power pipe tong rotary plunger inserter. 4,442,736, Cl. 81-57.150.
True Temper Railway Appliances, Inc.: *See*—
Fee, Graham M., 4,442,973, Cl. 238-349.000.
Trummlitz, Gunter: *See*—
Engel, Wolfhard; Trummlitz, Gunter; Schmidt, Gunther; Eberlein, Wolfgang; Hammer, Rudolf; and del Soldato, Piero, 4,443,452, Cl. 424-256.000.
Tsang, Paul J.: *See*—
Doo, Ven Y.; and Tsang, Paul J., 4,442,589, Cl. 29-571.000.
Tse, Ming K.: *See*—
Suh, Nam P.; and Tse, Ming K., 4,443,764, Cl. 324-456.000.
Tseng, C. C. Ceiling suspension device. 4,442,993, Cl. 248-327.000.
Tsuchiya, Michihiro: *See*—
Matsuoka, Manabu; Tsuchiya, Michihiro; and Tokuda, Yoshikazu, 4,443,615, Cl. 548-489.000.
Tsuchiya, Paul. Electronic metronome. 4,442,752, Cl. 84-484.000.
Tsuda, Masatoshi; Kobayashi, Takeshi; and Kaitani, Katsumi, to Katuragi Sangyo Co., Ltd. Sintered porous metal plate and its production. 4,443,404, Cl. 419-2.000.
Tsuji, Kiyoshi: *See*—
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; and Kato, Masayuki, 4,443,443, Cl. 424-246.000.
Tsuji, Masayoshi: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Nakashima, Yoichi; Tsuji, Masayoshi; Aoki, Tetsuo; and Ide, Hiroyuki, 4,443,626, Cl. 562-434.000.
Tsuji, Teruji: *See*—
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, 4,443,598, Cl. 544-90.000.
Tsukada, Takami: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,442,944, Cl. 215-1.00C.
Tsukada, Yukihisa: *See*—
Suenaga, Masahide; Tsukada, Yukihisa; and Yamamoto, Hiroshi, 4,443,294, Cl. 156-656.000.
Tsukiyasu, Tadashi: *See*—
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, 4,442,829, Cl. 126-452.000.
Tsuruta, Hisato: *See*—
Kashiwaya, Mineo; Nakagawa, Tohru; Yamada, Kinsaku; Kamifuji, Hiroshi; Oyama, Yoshishige; Kuroiwa, Hiroshi; and Tsuruta, Hisato, 4,442,818, Cl. 123-494.000.
Tsurutani, Saburo: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Tsurutani, Saburo; Kitamura, Minoru; Ito, Shuzo; Ohgami, Masahiko; Tochimori, Kenichi; and Inoue, Toshio, 4,442,706, Cl. 73-86.000.

Tsushima, Shuichi; and Matsumoto, Fuyuhiko, to Ricoh Company, Ltd. Image transfer and sheet separation apparatus for electrophotographic system. 4,443,095, Cl. 355-14.00R.
Tsutsumi, Saburo; Dozono, Kichihiko; Matayoshi, Yutaka; and Kunii, Kazuya, to Nissan Motor Company, Limited. Combustion chamber for spark ignition internal combustion engine. 4,442,808, Cl. 123-279.000.
Tsuwano, Haruo: *See*—
Wakamatsu, Atsuyuki; and Tsuwano, Haruo, 4,442,652, Cl. 53-258.000.
Wakamatsu, Atsuyuki; and Tsuwano, Haruo, 4,442,654, Cl. 53-266.00R.
Tsuzuki, Akira: *See*—
Togashi, Seigo; Tsuzuki, Akira; and Fujita, Hiro, 4,443,062, Cl. 350-332.000.
Tsuzuki, Hidehiro: *See*—
Asari, Akira; Noyori, Tatsuhiko; Tsuzuki, Hidehiro; Tabuchi, Takahisa; Masuda, Tsuneharu; and Takehata, Tetsuro, deceased, 4,443,143, Cl. 409-295.000.
Tubbs, Graham S.; and Ponder, James E., to Texas Instruments Incorporated. CMOS Integrated circuit device. 4,443,811, Cl. 357-42.000.
Tucker, Kevin M.; and Sandman, Terry L., to Jobst Institute, Inc. Pneumatic splint. 4,442,834, Cl. 128-90.000.
Tuovinen, Frans H.; Norrman, Bengt J. F.; and Heikkila, Risto M., to Outokumpu Oy. Method of mixing a hot furnace gas with another gas before the removal of the furnace gas from the furnace and a hood therefore. 4,443,878, Cl. 373-9.000.
Tupper, Leland C.: *See*—
Chausse, B. Paul; Espelage, Paul M.; Lippitt, David L.; and Tupper, Leland C., 4,443,747, Cl. 318-723.000.
Turner, Alan R.: *See*—
Neal, Brian P.; and Turner, Alan R., 4,442,957, Cl. 222-207.000.
Turner, Howard M., to Continental Group, Inc., The. Apparatus for and method of thermoforming plastic cans. 4,443,401, Cl. 264-544.000.
Tuzson, John J., to Allis-Chalmers Corporation. Method and centrifugal apparatus for slurry erosion testing. 4,442,707, Cl. 73-86.000.
Twieg, Robert: *See*—
Gendler, Paul L.; and Twieg, Robert, 4,443,302, Cl. 204-2.000.
Twin Disc, Incorporated: *See*—
Snoy, Joseph B., 4,442,730, Cl. 74-475.000.
Tyburcy, Raymond S.: *See*—
Weisz, William; and Tyburcy, Raymond S., 4,442,784, Cl. 112-158.00C.
Ube Industries, Ltd.: *See*—
Oshima, Tokio; Kimura, Tomio; Omata, Tetsuo; and Iwamoto, Noritada, 4,443,548, Cl. 435-280.000.
UCB, Societe Anonyme: *See*—
Rodriguez, Ludovic; and Baltes, Eugene, 4,443,460, Cl. 424-267.000.
Uchida, Shinobu, to Kabushiki Kaisha Daikin Seisakusho. Hydraulic clutch. 4,442,929, Cl. 192-52.000.
Uchida, Teruyoshi: *See*—
Uehara, Masaru; Uchida, Teruyoshi; and Kojima, Hirotaka, 4,442,841, Cl. 128-635.000.
Uchiyama, Tsugio: *See*—
Ishikawa, Hiromichi; Kitaori, Kazuhiko; Moriyama, Satoru; Chono, Tadashi; and Uchiyama, Tsugio, 4,443,439, Cl. 424-211.000.
Ueda, Ikuo; Matsuo, Masaaki; Tsuji, Kiyoshi; and Kato, Masayuki, to Fujisawa Pharmaceutical Co., Ltd. Cephem compounds. 4,443,443, Cl. 424-246.000.
Ueda, Kosaku. Collapsible telescope. 4,443,071, Cl. 350-546.000.
Uehara, Masaru; Uchida, Teruyoshi; and Kojima, Hirotaka, to Mitsubishi Rayon Company Limited. Electrode for living bodies. 4,442,841, Cl. 128-635.000.
Uemura, Yukihisa, to Toyo Rubber Industry Co., Ltd., The. Irregular wear-resistant radial ply tire. 4,442,879, Cl. 152-209.00R.
Uetrecht, Dale M.: *See*—
Simmons, Carlton J., Jr.; and Uetrecht, Dale M., 4,442,746, Cl. 84-1.010.
Uitermarkt, Edward L., to Vermeer Manufacturing Company. Machine control system for a wood or brush chipping machine. 4,442,877, Cl. 144-172.000.
Ulvestad, Edward A., to Flex-Kleen Corporation. Dust collecting filter cartridge and attachment structure for suspending same from baghouse tube sheet. 4,443,237, Cl. 55-379.000.
Umemura, Yoshifumi: *See*—
Suzuki, Hajime; Umemura, Yoshifumi; Iwano, Yoshimi; and Kimbara, Masahiko, 4,442,871, Cl. 139-435.000.
Underdown, David R.; and Glaze, O. Howard, to Baker Oil Tools, Inc. Proppant charge and method. 4,443,347, Cl. 252-8.55R.
Union Carbide Corporation: *See*—
Beddome, Robert A.; Saunders, John B.; and Fenner, Gary W., 4,443,238, Cl. 62-17.000.
Brown, Harry J.; Forgeng, William D.; and Brown, Charles W., 4,443,255, Cl. 75-251.000.
Robeson, Lloyd M.; and Matzner, Markus, 4,443,581, Cl. 525-92.000.
Toth, Tibor E., 4,443,687, Cl. 219-130.210.
Unisearch Limited: *See*—
Rogers, Peter L.; and Tribe, David E., 4,443,543, Cl. 435-161.000.
Rogers, Peter L.; and Tribe, David E., 4,443,544, Cl. 435-162.000.
United Kingdom Atomic Energy Authority: *See*—
Rosevear, Alan, 4,443,339, Cl. 210-635.000.
United States of America
Agriculture: *See*—
Morris, Cletus E.; and Welch, Clark M., 4,443,222, Cl. 8-189.000.
Air Force: *See*—
Belton, John P., Jr., 4,443,766, Cl. 328-151.000.
Jones, Bruce B., 4,442,776, Cl. 102-275.120.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,443,349, Cl. 252-49.900.
Wells, Jimmie D., 4,443,059, Cl. 350-310.000.
Army: *See*—
Bosserman, David A., 4,443,058, Cl. 350-294.000.
DeSantis, Charles M.; Zannella, Albert H.; Begala, Michael W.; Wills, John R.; and Czerwinski, Watson P., 4,443,803, Cl. 343-749.000.
Freeman, W. Larry, 4,443,303, Cl. 204-15.000.
Gaglione, Stanley, 4,443,800, Cl. 343-372.000.
Klose, Dirk R.; and Skudera, Jr. William J., 4,443,801, Cl. 343-442.000.
Pouri, Theodore H.; and Mottin, Howard C., 4,442,753, Cl. 89-46.000.
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Apley, Walter J.; Cliff, William C.; and Creer, James M., 4,442,720, Cl. 73-863.310.
Ballard, Evan O., 4,443,072, Cl. 350-584.000.
Bongianni, Wayne L., 4,442,714, Cl. 73-606.000.
Coon, Clifford L.; Harrar, Jackson E.; Pearson, Richard K.; and McGuire, Raymond R., 4,443,308, Cl. 204-103.000.
Hahs, Charles A.; and Burbage, Charles H., 4,442,861, Cl. 137-595.000.
Nowlin, Charles H., 4,443,768, Cl. 328-167.000.
Pruett, David J.; and McTaggart, Donald R., 4,443,413, Cl. 423-10.000.
Shell, Pamela K., 4,443,186, Cl. 432-103.000.
Swoboda, Carl A., 4,442,700, Cl. 73-32.00A.
Health and Human Services: *See*—
Buchanan, Thomas M.; Pearce, William; and Chen, Kirk C. S., 4,443,431, Cl. 424-92.000.
National Aeronautics and Space Administration: *See*—
Bailey, Gary C., 4,443,701, Cl. 250-332.000.
Compton, Leslie E., 4,443,321, Cl. 208-8.0LE.
Handlykken, Mathias B., 4,443,724, Cl. 310-171.000.
National Areonautics and Space Administration: *See*—
Coe, Charles F.; and Parra, Gilbert T., 4,442,716, Cl. 73-756.000.
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Findeisen, Allen G.; Mellenbruch, Larry L.; and Lentz, Wallace D., 4,443,765, Cl. 328-55.000.
Rousseau, David G., 4,442,986, Cl. 244-12.100.
Snider, Hugh H., Jr.; and Marion, Richard A., 4,443,119, Cl. 374-153.000.
Vetter, Ronald F., 4,442,666, Cl. 60-39.470.
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Brundige, William L., 4,443,390, Cl. 264-13.000.
Furtner, Gerhard, 4,443,822, Cl. 360-67.000.
Jansen, Gerardus L. M., 4,443,721, Cl. 310-14.000.
Jourdain, Philippe; Florens, Georges E., deceased; and Souquet, Georges A. L., representative, 4,442,966, Cl. 228-123.000.
Mewissen, Jan A. C., 4,443,778, Cl. 336-90.000.
Steenberg, Johannes, 4,443,874, Cl. 369-291.000.
van de Pas, Hermanus A.; and Knobbout, Huibert A., 4,442,967, Cl. 228-159.000.
van Roermund, Arthur H. M., 4,443,885, Cl. 377-57.000.
van Tol, Maurits W., 4,443,737, Cl. 313-431.000.
Woldring, Leonard, 4,443,739, Cl. 315-244.000.
U.S. Terminals, Inc.: *See*—
Dozier, Hilliard, 4,442,770, Cl. 101-93.320.
United Technologies Corporation: *See*—
Chenausky, Peter P.; and Newman, Leon A., 4,443,877, Cl. 372-38.000.
Cowher, Melvyn E.; and Shuskus, Alexander J., 4,443,489, Cl. 427-38.000.
Maciolek, Joseph R.; and Diamond, Edmond D., 4,443,853, Cl. 364-434.000.
Olsen, Eric G., 4,442,647, Cl. 52-393.000.
Unitrode Corporation: *See*—
Van Dyk Soerewyn, Herman F., 4,443,655, Cl. 174-52.0PE.
Universal Manufacturing Corp.: *See*—
Delvy, Robert J.; Pentecost, Harry L.; and Patterson, Leroy R., 4,443,829, Cl. 361-275.000.
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Wylie, James C., Sr., 4,442,656, Cl. 53-552.000.
University of Delaware, The: *See*—
Catalano, Anthony W.; and Bhushan, Manjul, 4,443,653, Cl. 136-265.000.
University of Georgia Research Foundation, Inc.: *See*—
Cormier, Milton J., 4,443,446, Cl. 424-247.000.
University of Illinois Foundation: *See*—
Chervan, Munir; and Deeslie, William D., 4,443,540, Cl. 435-69.000.
Mayes, Paul E., 4,443,802, Cl. 343-729.000.
University of Pennsylvania: *See*—
Brighton, Carl T.; and Black, Jonathan, 4,442,846, Cl. 128-784.000.
UOP Inc.: *See*—
Carson, Don B., 4,443,419, Cl. 423-244.000.
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Sternisa, Danilo; and Kistner, Herbert, 4,443,567, Cl. 523-211.000.

Upjohn Company, The: *See*—
Anderson, Bradley D.; and Conradi, Robert A., 4,443,440, Cl. 424-243.000.
Fraser, Thomas H.; and Bruce, Barbara J., 4,443,539, Cl. 435-68.000.
Knight, John C.; and Wovcha, Merle G., 4,443,541, Cl. 435-149.000.
Lömen, Pavel L., 4,443,476, Cl. 424-317.000.
Padilla, Amphlett G., 4,443,631, Cl. 564-412.000.
Van Rheenen, Verlan H., 4,443,377, Cl. 260-397.400.

Urabe, Hirokuni, to Shigiya Machinery Works, Ltd. Shock absorbing apparatus for travelling a table or tool rest in machine tools. 4,442,725, Cl. 74-89.150.

Usami, Kenichi: *See*—
Sukekawa, Masayuki; Tobita, Yoshimitsu; Kirihara, Seishin; Morimoto, Hisashi; Usami, Kenichi; and Iijima, Katsumi, 4,443,406, Cl. 420-584.000.

Ushio Denki Kabushiki Kaisha: *See*—
Horiuchi, Tatsuo; and Kiyota, Kazushige, 4,443,836, Cl. 362-375.000.

USM Corporation: *See*—
Lauckhardt, Gerhard; Fichtner, Rudi; and Broning, Manfred, 4,442,563, Cl. 12-145.000.

USV Pharmaceutical Corporation: *See*—
Huang, Fu-chih, 4,443,610, Cl. 548-150.000.

Utah Research & Development Co., Inc.: *See*—
Newman, William A., 4,443,752, Cl. 320-22.000.

Valdiserri, Mario: *See*—
Pansolli, Paolo; Barbaro, Aurelio; Maimone, Adriano; and Valdiserri, Mario, 4,443,267, Cl. 127-46.200.

Vale, Wylie W., Jr.: *See*—
Sherwood, Nancy M.; Eiden, Lee E.; Brownstein, Michael J.; Spiess, Joachim; Rivier, Jean E. F.; and Vale, Wylie W., Jr., 4,443,368, Cl. 260-112.5LH.

Van Achterberg, Johan; and Miles, George N., to Palmieri, Elsie. Apparatus for making pastry products. 4,442,761, Cl. 99-404.000.

van de Pas, Hermanus A.; and Knobbout, Huibert A., to U.S. Philips Corporation. Method of providing raised electrical contacts on electronic microcircuits. 4,442,967, Cl. 228-159.000.

van der Meijden, Johannes; and de Vries, Auke F., to Shell Oil Company. Process for the preparation of an aromatic hydrocarbon mixture. 4,443,640, Cl. 585-418.000.

Vandermeulen, Meine: *See*—
Gesing, Adam J.; McIntyre, John; Vandermeulen, Meine; Cambridge, Edward L.; and DeAngelis, Thomas P., 4,443,313, Cl. 204-240.000.

Vandervaart, Gerry, to Kool-Fire Limited. Heat exchanger housing with fan operated door. 4,442,890, Cl. 165-124.000.

Van Duin, Pieter J.; and Van Erkel, Joost, to Nederlandse Centrale Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek. Process for the detoxification of chemical waste materials. 4,443,309, Cl. 204-149.000.

Van Dyk Soerewyn, Herman F., to Unitrode Corporation. Extruded semiconductor package and fabrication method. 4,443,655, Cl. 174-52.0PE.

Van Erkel, Joost: *See*—
Van Duin, Pieter J.; and Van Erkel, Joost, 4,443,309, Cl. 204-149.000.

Van Paassen, Nicolaas A. I., to Chem-Y Fabriek Van Chemische Producten B.V. Aqueous bleaching agent with cleaning action. 4,443,353, Cl. 252-103.000.

Van Rheenen, Verlan H., to Upjohn Company, The. Isomerization-acylation process. 4,443,377, Cl. 260-397.400.

van Rijckevorsel, Rainer: *See*—
Meinecke, Dieter; Schmidt, Werner; Schussler, Rudolf; and van Rijckevorsel, Rainer, 4,442,836, Cl. 128-314.000.

van Roermund, Arthur H. M., to U.S. Philips Corporation. Charge transfer method and device for carrying out the method. 4,443,885, Cl. 377-57.000.

van Tol, Maurits W., to U.S. Philips Corporation. Device for displaying pictures by means of a cathode-ray tube. 4,443,737, Cl. 313-431.000.

van Wersch, Kurt; and Pabst, Manfred, to Monforts, A. Method for continuously finishing and/or dyeing planar textile structures. 4,442,560, Cl. 8-151.000.

Varona, Jesus: *See*—
Junck, Gunter; Seidel, Hans; and Varona, Jesus, 4,442,712, Cl. 73-462.000.

Veach, B. R., to Nationwide Carriers Incorporated. Heater for a diesel fuel filter. 4,442,819, Cl. 123-557.000.

Veb Kombinat Polygraph "Werner Lamberz": *See*—
Jentzsch, Arndt; Johne, Hans; and Muller, Wolfgang, 4,442,775, Cl. 101-365.000.

Velo-Bind Inc.: *See*—
Szanto, Elmer G., 4,442,743, Cl. 83-372.000.

Velsicol Chemical Corporation: *See*—
Hokama, Takeo, 4,443,248, Cl. 71-98.000.

Venema, Eelke S.: *See*—
Bergsma, Wijtse; and Venema, Eelke S., 4,442,597, Cl. 30-43.600.

Verbatim Corporation: *See*—
Martinelli, Lawrence G.; and Garrison, Mark R., 4,443,398, Cl. 264-235.000.

Verdicchio, Robert J.: *See*—
Guth, Jacob J.; and Verdicchio, Robert J., 4,443,362, Cl. 252-545.000.

Vermeer Manufacturing Company: *See*—
Uitermarkt, Edward L., 4,442,877, Cl. 144-172.000.

Versace, Richard W.: *See*—
Girijavallabhan, Viyyoor M.; Ganguly, Ashit K.; Pinto, Patrick A.; and Versace, Richard W., 4,443,373, Cl. 260-245.20R.

Vette, Friedrich, to Applied Power Inc. Tilt-cab truck including apparatus to secure uniform advance and retraction of the tilt cylinders. 4,442,912, Cl. 180-89.150.

Vetter, Bruce W., to BagMan, Inc. Saddlebags. 4,442,960, Cl. 224-32.00A.

Vetter, Ronald F., to United States of America, Navy. Fuel fire resistant motor. 4,442,666, Cl. 60-39.470.

Viaud, Nicole: *See*—
Dalibard, Gerard; and Viaud, Nicole, 4,443,405, Cl. 420-573.000.

Victor Company of Japan, Ltd.: *See*—
Shiramizu, Takami, 4,443,887, Cl. 377-110.000.
Yamamoto, Toshiharu; and Nakatani, Koichiro, 4,443,128, Cl. 403-385.000.

Vidalin, Jacques. System for hi-speed comparisons between variable format input data and stored tabular reference data. 4,443,860, Cl. 364-900.000.

Voest-Alpine Aktiengesellschaft: *See*—
Hirschmanner, Franz; and Rom, Ernst, 4,442,690, Cl. 72-128.000.

Vogt, Wilhelm: *See*—
Prange, Uwe; El Chahawi, Moustafa; Vogt, Wilhelm; and Richtzenbain, Hermann, 4,443,624, Cl. 560-204.000.

Voigt, Otto K. H.: *See*—
Achinger, Michael; Streitenberger, Walter; Voigt, Otto K. H.; and Wolter, Hans, 4,442,882, Cl. 164-187.000.

Vol-Pro Systems, Inc.: *See*—
Watts, Robert H., 4,443,109, Cl. 366-134.000.

W. H. Brady Co.: *See*—
Downing, Gerald T., 4,442,939, Cl. 206-345.000.

W. L. Gore & Associates, Inc.: *See*—
Hill, Ronald A.; Tillmanns, Ralf; and Sieberling, Bernd, 4,443,657, Cl. 174-110.0FC.
Worden, Dexter; Wilson, Frederic T.; and Grubb, Linda J., 4,443,511, Cl. 428-198.000.

W. R. Grace & Co.: *See*—
Morgan, Charles R.; and Ketley, Arthur D., 4,443,495, Cl. 427-96.000.

W. R. Meadows, Inc.: *See*—
Frier, Richard A., 4,443,578, Cl. 524-705.000.

Wachala, Raymond J.: *See*—
Bhattacharyya, Bhupati I.; Slovinsky, Manuel; Wachala, Raymond J.; Beske, Lawrence E.; and McCullar, Michael L., 4,443,576, Cl. 524-522.000.

Wada, Hiroto: *See*—
Tanaka, Masamichi; and Wada, Hiroto, 4,443,711, Cl. 307-400.000.

Wada, Tetsuo: *See*—
Sakurai, Masao; and Wada, Tetsuo, 4,443,328, Cl. 208-106.000.

Wada, Tomio: *See*—
Funada, Fumiaki; Matsuura, Masataka; and Wada, Tomio, 4,443,065, Cl. 350-335.000.
Funada, Fumiaki; Takamatsu, Toshiaki; and Wada, Tomio, 4,443,819, Cl. 358-236.000.

Wadle, Heinrich: *See*—
Jung, Eggert; and Wadle, Heinrich, 4,443,060, Cl. 350-317.000.

Waffner, William D.: *See*—
Hoffman, Stanley J., Jr.; and Waffner, William D., 4,442,855, Cl. 137-83.000.

Wainwright, Clyde: *See*—
Callihan, Rudy B.; and Wainwright, Clyde, 4,442,894, Cl. 166-156.000.

Wakamatsu, Atsuyuki; and Tsuwano, Haruo, to Daiwa Can Company, Limited. Apparatus for automatically packing end closures for cans in paper bags. 4,442,652, Cl. 53-258.000.

Wakamatsu, Atsuyuki; and Tsuwano, Haruo, to Daiwa Can Company, Limited. Apparatus for automatically packing end closures for cans in paper bags. 4,442,654, Cl. 53-266.00R.

Wakatsuki, Goroei; and Yamamoto, Sadashi, to Honda Giken Kogyo Kabushiki Kaisha. Automatic regulator for internally expanding drum brake. 4,442,923, Cl. 188-79.50K.

Waldau, Geoffrey. Fuel feeder device for space heating stoves. 4,442,825, Cl. 126-68.000.

Waldner, Michael: *See*—
Grinberg, Jan; Waldner, Michael; Braatz, Paul O.; and Jacobson, Alexander D., 4,443,064, Cl. 350-334.000.

Walker, Brooks. Carrier for garment bags and the like. 4,442,927, Cl. 190-18.00A.

Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., to Wallace Mfg. Corp. Sawing and pruning apparatus of the compound action passby blade type. 4,442,603, Cl. 30-249.000.

Wallace Mfg. Corp.: *See*—
Wallace, Edward M.; Gosselin, Robert G.; and Labarre, Ernest D., 4,442,603, Cl. 30-249.000.

Walter, John; and Kubis, Charles S., to Continental Group, Inc., The. Method of and apparatus for shaping neck and providing terminal curl on can end. 4,442,693, Cl. 72-354.000.

Walter, Lothar; and Reith, Walter, to SKF Kugellagerfabriken GmbH. Rolling bearing for lengthwise movement. 4,443,042, Cl. 308-6.00C.

Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; and Walter, Lothar, 4,443,210, Cl. 474-199.000.

Walwyn, Craig M.; and Bohonos, Donald E., to General Signal Corporation. Pellicle mounting fixture. 4,443,098, Cl. 355-74.000.

Wank, Larry A.; and Braitling, Joseph G., to North American Philips Corporation. Magnetic head pole piece mount of TiO_2-CaO. 4,443,825, Cl. 360-104.000.

Wanuga, Stephen; Kong, Wendell M. T.; and Stearns, Cleo M., to General Electric Company. Frequency trimming of saw resonators. 4,442,574, Cl. 29-25.350.

Ward, Terence J., to John Wyeth & Brother Limited. N-[2-[[1-[1H-Indolylalkyl- or oxoalkyl]-4-piperidinyl]-amino]-2-oxoethyl]-arylcarboxamide derivatives. 4,443,461, Cl. 424-267.000.

Ward, Terence J., to John Wyeth & Brother, Limited. Antidiarrhoeal agents. 4,443,467, Cl. 424-274.000.

Ware, Gordon K., to Chicago Roller Skate Company, The. Roller skate. 4,443,022, Cl. 280-11.280.

Warner-Lambert Company: *See*—
Knecht, Adolph; Schneider, Michael; and Ambrosch, Walter, 4,443,433, Cl. 424-157.000.

Warren, James C. Earplug mounting device with audio passageway. 4,443,668, Cl. 179-156.00A.

Wastell, Trevor T.: *See*—
Brower, Bernard C.; and Wastell, Trevor T., 4,442,569, Cl. 17-52.000.

Watanabe, Koichiro: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,443,603, Cl. 544-373.000.

Watanabe, Koji: *See*—
Harada, Toshimitsu; and Watanabe, Koji, 4,443,084, Cl. 354-173.110.

Watanabe, Shinichi: *See*—
Yoshida, Makoto; Watanabe, Shinichi; and Suzuki, Fuminori, 4,443,116, Cl. 368-202.000.

Waters, John M., to British Railways Board. Measuring vehicles for roadways. 4,442,709, Cl. 73-146.000.

Watrous, Robert B.: *See*—
Frater, Norman K.; Gill, Gregory G.; and Watrous, Robert B., 4,443,824, Cl. 360-104.000.

Watson, James M.; and Forward, Cleve, to Cosden Technology, Inc. Reaction of benzene with ethylene oxide to produce styrene. 4,443,643, Cl. 585-437.000.

Watt, Charles W., to Lukens General Industries, Inc. Conformable removable reflective marking tape. 4,443,510, Cl. 428-149.000.

Watts, Donald R. Angular and swiveling head for gas consuming electric welding torches. 4,443,683, Cl. 219-74.000.

Watts, Robert H., to Vol-Pro Systems, Inc. Method and apparatus for continuous feeding, mixing and blending. 4,443,109, Cl. 366-134.000.

Weatherford/Lamb, Inc.: *See*—
True, Martin E.; and Timmerman, Terry D., 4,442,736, Cl. 81-57.150.

Weber, Harvey L. Lock for garage door equipped with automatic garage door opener. 4,442,631, Cl. 49-199.000.

Weber, John H.; and Gilman, Paul S., to Huntington Alloys Inc. Production of mechanically alloyed powder. 4,443,249, Cl. 75-0.50R.

Weber, Rebecca J.: *See*—
Bolick, Martha E.; Weber, Rebecca J.; and Lang, Theodore B., 4,442,552, Cl. 2-49.00R.

Weber, Wolfgang: *See*—
Schermutzki, Konrad; and Weber, Wolfgang, 4,443,412, Cl. 422-247.000.

Webster, Donald R., to Pacific Scientific Instruments Company. Optical analyzing instrument with equal wavelength increment indexing. 4,443,108, Cl. 356-418.000.

Weeks, Paul D.: *See*—
LaMattina, John L.; and Weeks, Paul D., 4,443,621, Cl. 560-142.000.

Wei, Peter H. L.; and Bell, Stanley C., to American Home Products Corporation. Antiviral thiazolo [5,4-b] pyridine compounds. 4,443,606, Cl. 546-114.000.

Weihe, Vernon I. Dead reckoning navigation instrument. 4,442,605, Cl. 33-1.0SD.

Weinberg, Melvin S.; and Cormier, Alan D., to Instrumentation Laboratory Inc. Analysis system. 4,443,407, Cl. 422-68.000.

Weingarten, Harold I., to Monsanto Company. Peptide and peptolide substrates for mammalian collagenase. 4,443,367, Cl. 260-112.50R.

Weinstein, Robert: *See*—
Stemerman, Michael B.; Weinstein, Robert; and Maciag, Thomas, 4,443,546, Cl. 435-240.000.

Weir, Donald R.; and Masters, Ian M., to Sherritt Gordon Mines Limited. Recovery of zinc from zinc containing sulphidic materials. 4,443,253, Cl. 75-120.000.

Weirich, Walter: *See*—
Beckmann, Klaus; Grisebach, Hans-Theodor; and Weirich, Walter, 4,443,135, Cl. 405-302.000.

Weis, Robert, to Foster Grant Corporation. Continuous gradient dyeing of plastic ribbon. 4,442,788, Cl. 118-405.000.

Weiser, Martin: *See*—
Kotulla, Bernhard; Weiser, Martin; Faltin, Jurgen; Preis, Lothar; Schmidt, Rudolf; and Born, Eberhard, 4,443,132, Cl. 405-260.000.

Weiss, Richard: *See*—
Becker, Josef; Simon, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,443,392, Cl. 264-25.000.

Weisz, William; and Tyburcy, Raymond S., to Singer Company, The. Vertically stacked components in a control module for a sewing machine. 4,442,784, Cl. 112-158.00C.

Welch, Clark M.: *See*—
Morris, Cletus E.; and Welch, Clark M., 4,443,222, Cl. 8-189.000.

Welker Engineering Company: *See*—
Welker, Robert H., 4,442,999, Cl. 251-358.000.

Welker, Robert H., to Welker Engineering Company. Reinforced plug for flow regulators. 4,442,999, Cl. 251-358.000.

Wellcome Australia Limited: *See*—
Chappell, Anthony G., 4,443,216, Cl. 604-67.000.

Welle, Handricus B. A.: *See*—
Trijzelaar, Hans B.; de Bode, Ronus; and Welle, Handricus B. A., 4,443,453, Cl. 424-258.000.

Wells, Jimmie D., to United States of America, Air Force. High energy laser mirror. 4,443,059, Cl. 350-310.000.

Wells, John R. Serum preparator. 4,443,345, Cl. 210-782.000.

Wells, Rodney L.; and Rowe, Monty L., to Allied Corporation. Additive dispersions and process for their incorporation with fiber-forming polymers. 4,443,573, Cl. 524-308.000.

Wendorf, Wilfried: *See*—
Heller, Gerhard; Adelmann, Manfred; Wendorf, Wilfried; and Konigs, Wilhelm, 4,443,174, Cl. 425-147.000.

Wesemeyer, Jurgen: *See*—
Brautigam, Rolf; Wesemeyer, Jurgen; and Zobl, Hartmut, 4,443,835, Cl. 362-300.000.

Wesjay, Inc.: *See*—
Dixon, James N., 4,443,171, Cl. 425-78.000.

West Electric Co., Ltd.: *See*—
Kashihara, Toshitsugu; Yoshino, Tsunemi; Morioka, Akitoshi; and Iwata, Hiroshi, 4,443,087, Cl. 354-401.000.

West Point Pepperell, Inc.: *See*—
Smith, Richard, 4,443,622, Cl. 560-166.000.

Westalische Metall Industrie KG Hueck & Co.: *See*—
Schafer, Heinz; and Schrader, Wilhelm, 4,443,834, Cl. 362-280.000.

Western Electric Company, Inc.: *See*—
Haynes, Richard, 4,443,305, Cl. 204-59.00M.

Westinghouse Electric Corp.: *See*—
Calvino, Ben J., 4,443,674, Cl. 200-144.0AP.
Jackovitz, John F.; Seidel, Joseph; and Pantier, Earl A., 4,443,526, Cl. 429-223.000.
Jessee, Ralph D., 4,443,842, Cl. 363-41.000.
Seman, Edward J., 4,443,685, Cl. 219-121.0LH.

Whitaker, William C.: *See*—
Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., 4,442,701, Cl. 73-32.00R.

Whitcomb, Carl E., to Board of Regents for Oklahoma Agricultural & Mechanical Colleges Acting for Oklahoma State University. Root-pruning container. 4,442,628, Cl. 47-66.000.

White, Charles S. Method of making hoi drawn low friction bearing. 4,442,578, Cl. 29-149.50S.

White, George R.: *See*—
Hills, Derek W.; and White, George R., 4,443,375, Cl. 260-245.600.

Whitear, Brian R. D.: *See*—
Postle, Stephen R.; Thomas, Patrick D. P.; and Whitear, Brian R. D., 4,443,537, Cl. 430-566.000.

Whittingham, Thomas D.; Hennig, William G.; and Brahler, Thomas A. Meat log cutter. 4,442,741, Cl. 83-80.000.

Wibom, Gustav H. O. Vehicle mounted hole forming machine. 4,442,904, Cl. 173-28.000.

Wiggins, Richard H., to Texas Instruments Incorporated. Speech analysis circuits using an inverse lattice network. 4,443,859, Cl. 364-724.000.

Wiklund, Johan E., to Boliden Aktiebolag. Method for separating gaseous, elementary mercury from a gas. 4,443,417, Cl. 423-210.000.

Wilczewski, Robert H.: *See*—
Blomquist, James E.; and Wilczewski, Robert H., 4,443,122, Cl. 400-124.000.

Wildman, Alexander J. Multi-purpose orthodontic bracket. 4,443,189, Cl. 433-10.000.

Wilensky, Joseph, to Kurtis, Soma; and Sloan, Jack. Method for thermodynamic cycle. 4,442,675, Cl. 60-654.000.

Wilkinson Sword Limited: *See*—
Adams, James E.; and Laurie, Alexander S., 4,442,627, Cl. 47-56.000.

Willer, Rodney L., to United States of America, Navy. Trans-1,4,5,8-tetranitro-1,4,5,8-tetraazadecalin. 4,443,602, Cl. 544-350.000.

William H. Rorer, Inc.: *See*—
Douglas, George H.; Studt, William L.; Dodson, Stuart A.; and Zimmerman, Harry K., 4,443,456, Cl. 424-263.000.

Williams, John H.: *See*—
Mino, George M.; Dustin, Donald L.; and Williams, John H., 4,443,501, Cl. 427-360.000.

Williams, Philip D. L.: *See*—
Cramp, Harry D.; Blythe, Malcolm R.; and Williams, Philip D. L., 4,443,797, Cl. 343-5.0SC.

Wills, John R.: *See*—
DeSantis, Charles M.; Zannella, Albert H.; Begala, Michael W.; Wills, John R.; and Czerwinski, Watson P., 4,443,803, Cl. 343-749.000.

Willuhn, Dietrich: *See*—
Gross, Reinhold; Willuhn, Dietrich; and Witte, Horst, 4,443,134, Cl. 405-288.000.

Wilmshurst, Eric C.: *See*—
Jeffery, James E.; and Wilmshurst, Eric C., 4,443,449, Cl. 424-250.000.

Wilson, David A.; and Buxton, James L., to SRI International. Frequency varied ultrasonic imaging array. 4,442,713, Cl. 73-599.000.

Wilson, Frederic T.: *See*—
Worden, Dexter; Wilson, Frederic T.; and Grubb, Linda J., 4,443,511, Cl. 428-198.000.
Wilson, Thomas B., Jr.: *See*—
Monteath, Don; and Wilson, Thomas B., Jr., 4,442,881, Cl. 160-25.000.
Wilson, Thomas P. Opening and closing means for a container top. 4,442,950, Cl. 220-269.000.
Winteler, Werner: *See*—
Oetiker, Hans; Linzberger, Robert; Ketting, Leendert; and Winteler, Werner, 4,442,980, Cl. 241-34.000.
Winter, William E., Jr.: *See*—
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Winterholler, Cohann: *See*—
Gunther, Siegfried; and Winterholler, Cohann, 4,442,611, Cl. 34-41.000.
Wirz, Armin: *See*—
Muller, Kurt; and Wirz, Armin, 4,443,689, Cl. 219-469.000.
Wistra GmbH Thermoprozesstechnik: *See*—
Bonnekamp, Horst; Sauer, Baldur; Wolkewitz, Heinrich; Hepp, Gunter; and Kraemer, Walter, 4,443,184, Cl. 432-13.000.
Witte, Ernst-Christian; Wolfe, Hans P.; Stegmeier, Karlheinz; and Roesch, Egon, to Boehringer Mannheim GmbH. Sulphonamidophenylcarboxylic acid compounds and pharmaceutical compositions containing them. 4,443,477, Cl. 424-319.000.
Witte, Horst: *See*—
Gross, Reinhold; Willuhn, Dietrich; and Witte, Horst, 4,443,134, Cl. 405-288.000.
Wohlford, William P., to Deere & Company. Track link including removable sprocket-engaging wear cap. 4,443,041, Cl. 305-43.000.
Wohlrab, Walter, to Krauss-Maffei AG. Rapid-action mold closer. 4,443,179, Cl. 425-590.000.
Wojciechowicz, Alexander, Jr. Electrical connector apparatus and method for a temporary cardiac pacing wire. 4,442,840, Cl. 128-419.00P.
Wojcieson, Raymond J.; and Nowak, Leonard G., to Hauck Manufacturing Company. Burner and method. 4,443,182, Cl. 431-183.000.
Woldring, Leonard, to U.S. Philips Corporation. Electric device comprising at least one low-pressure mercury vapor discharge tube. 4,443,739, Cl. 315-244.000.
Wolf, Karlheinz: *See*—
Wolff, Joachim; Wolf, Karlheinz; Koll, Jochen; Hornle, Reinhold; Molls, Hans-Heinz; and Paulat, Volker, 4,443,225, Cl. 8-549.000.
Wolfe, Daniel S.: *See*—
Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., 4,442,701, Cl. 73-32.00R.
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Cowherd, David C.; DeWitte, Jerry L.; Taylor, Kenneth A.; Whitaker, William C.; Wolfe, Daniel S.; and Wolfe, Gene A., 4,442,701, Cl. 73-32.00R.
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Wolff, Guenter: *See*—
Dworak, Wilhelm; Fader, Martin; Jons, Claus; Mayer, Siegfried; Muller, Karl-Heinz; Rasper, Manfred; Schuldt, Dietrich; Talmon, Wolfgang; and Wolff, Guenter, 4,443,168, Cl. 418-131.000.
Wolff, Joachim; Wolf, Karlheinz; Koll, Jochen; Hornle, Reinhold; Molls, Hans-Heinz; and Paulat, Volker, to Bayer Aktiengesellschaft. Liquid-crystalline phase of an azo reactive dyestuff, and its use for the dyeing and printing of natural and synthetic substrates. 4,443,225, Cl. 8-549.000.
Wolfrom, Glen W.: *See*—
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Wolfson, Robert G.: *See*—
Little, Roger G.; Wolfson, Robert G.; and Solomon, Stanley J., 4,443,488, Cl. 427-38.000.
Wolkewitz, Heinrich: *See*—
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Wolter, Hans: *See*—
Achinger, Michael; Streitenberger, Walter; Voigt, Otto K. H.; and Wolter, Hans, 4,442,882, Cl. 164-187.000.
Wong, George S.; Catterfeld, Fritz C.; and Hauenstein, Clifford A., to Rockwell International Corporation. Axial slurry pump. 4,443,152, Cl. 415-143.000.
Woo, James T. K., to SCM Corporation. Polymerization process and product. 4,443,568, Cl. 523-406.000.
Wood, Eric, to Insituform International N.V. Cutters. 4,442,891, Cl. 166-55.200.
Wood, Robin: *See*—
Brittain, David R.; and Wood, Robin, 4,443,465, Cl. 424-273.00R.
Woods, Edward J.: *See*—
Jacovides, Linos J.; and Woods, Edward J., 4,443,678, Cl. 219-10.410.
Wooley, Robert E., to National Service Industries, Inc. Envelope assembly apparatus. 4,443,211, Cl. 493-188.000.
Wooten, James F. Test apparatus for circuit board racks. 4,443,755, Cl. 324-66.000.
Worden, Dexter; Wilson, Frederic T.; and Grubb, Linda J., to W. L. Gore & Associates, Inc. Elastomeric waterproof laminate. 4,443,511, Cl. 428-198.000.
Worni, Guido, to Ferag AG. Method of manipulating printed products and means and apparatus for performance thereof. 4,443,287, Cl. 156-247.000.
Worrallo, Anthony C. Modular shelf support. 4,442,992, Cl. 248-243.000.
Worthington, Paul A., to Imperial Chemical Industries PLC. Thiazolidinones. 4,443,454, Cl. 424-263.000.
Worthington, Paul A., to Imperial Chemical Industries PLC. Fungidical thiazolidinones. 4,443,455, Cl. 424-263.000.
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Wright, John: *See*—
Grimwood, Geoffrey L.; and Wright, John, 4,443,213, Cl. 494-38.000.
Wright, John H.; and Smith, Alfred H., Jr., to General Electric Company. Protective lubricant composition. 4,443,348, Cl. 252-37.200.
Wrightson, Robert W., to F.F. Seeley Nominees Pty. Ltd. Evaporative cooler pad frame support. 4,443,386, Cl. 261-29.000.
Wunderlich, Klaus: *See*—
Seidler, Helmut; Soll, Manfred; and Wunderlich, Klaus, 4,443,369, Cl. 260-131.000.
Wyatt, William G., to Trans-Texas Energy, Inc. Downhole vapor generator. 4,442,898, Cl. 166-303.000.
Wylie, James C., Sr., to Universal Packaging, Inc. Filling and sealing machine for providing a flat bottom package. 4,442,656, Cl. 53-552.000.
X-Pert Well Service, Inc.: *See*—
Rhoads, Gerald A., Sr., 4,442,918, Cl. 182-10.000.
Xerox Corporation: *See*—
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Yaguchi, Tomonobu: *See*—
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Yale University: *See*—
Thakur, Madhukar L., 4,443,426, Cl. 424-1.100.
Yamada, Hiroshi: *See*—
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Yamada, Kinsaku: *See*—
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Yamada, Kozo; and Tanaka, Takayuki, to Toho Beslon Co., Ltd. Heat-moldable laminate and process for molding said laminated structures. 4,443,507, Cl. 428-114.000.
Yamada, Shoji; Kanada, Eiji; and Mathubara, Eiji, to Mitsubishi Paper Mills, Ltd. Deleting agents for printing plates and method for deletion. 4,443,531, Cl. 430-204.000.
Yamada, Takeshi, to Omron Tateisi Electronics Co. Regulated single-ended self oscillating, DC-DC converter. 4,443,838, Cl. 363-19.000.
Yamagata, Kenji: *See*—
Noda, Kanji; Nakagawa, Akira; Yamagata, Kenji; Nakashima, Yoichi; Tsuji, Masayoshi; Aoki, Tetsuo; and Ide, Hiroyuki, 4,443,626, Cl. 562-434.000.
Yamaguchi, Elaine S.; and Liston, Thomas V., to Chevron Research Company. Oil-soluble zinc cyclic hydrocarbyl dithiophosphate-succinimide complex and lubricating oil compositions containing same. 4,443,360, Cl. 252-46.700.
Yamaguchi, Ryoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Electric motor unit. 4,443,043, Cl. 308-10.000.
Yamaguchi, Takashi: *See*—
Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,443,812, Cl. 357-53.000.
Yamaguchi, Toru: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Grinde, James E., 4,442,913, Cl. 180-190.000.
Yamakami, Yoshiaki; and Yoshimitsu, Arata, to Kubota Ltd. Roll for continuous casting. 4,442,883, Cl. 164-448.000.
Yamakawa, Toru, to Fuji Jukogyo Kabushiki Kaisha. Internal combustion engine provided with a plurality of power units. 4,442,805, Cl. 123-198.00F.
Yamamoto, Hiroshi: *See*—
Suenaga, Masahide; Tsukada, Yukihisa; and Yamamoto, Hiroshi, 4,443,294, Cl. 156-656.000.
Yamamoto, Nobuyuki; Nishikawa, Yasuo; Andou, Yuji; Naruo, Kyoichi; and Okita, Tsutomu, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,443,514, Cl. 428-216.000.
Yamamoto, Sadashi: *See*—
Wakatsuki, Goroei; and Yamamoto, Sadashi, 4,442,923, Cl. 188-79.50K.
Yamamoto, Sumio: *See*—
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Yamamoto, Toshiharu; and Nakatani, Koichiro, to Victor Company of Japan, Limited; and Nihon Velbon Seiki Kogyo Kabushiki Kaisha. Fixing device having two pivotally interconnected clamps. 4,443,128, Cl. 403-385.000.

Yamamoto, Yuichi: *See*—
Nakamura, Noriaki; Kishimoto, Tomio; and Yamamoto, Yuichi, 4,443,670, Cl. 200-11.0DA.
Yamane, Satoshi: *See*—
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Yamaoka, Yasuhiro: *See*—
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Yamashita, Yoshimi; and Yamamoto, Sumio, to Fujitsu Limited. Method of electron beam exposure. 4,443,704, Cl. 250-491.100.
Yamato, Takashi: *See*—
Muryobayashi, Takashi; Miyake, Hajimu; and Yamato, Takashi, 4,443,478, Cl. 424-331.000.
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Yamazaki, Kyuya: *See*—
Kamatani, Yoshio; Tanaka, Michio; and Yamazaki, Kyuya, 4,443,590, Cl. 528-51.000.
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, to Asahi-Dow Limited. Organic europium salt phosphor. 4,443,380, Cl. 260-429.200.
Yanagida, Kiyomi; Hirokane, Tadashi; Tsukiyasu, Tadashi; and Sato, Tomoari, to Sumitomo Aluminium Smelting Company, Ltd. Material for selective absorption of solar energy and production thereof. 4,442,829, Cl. 126-452.000.
Yanagiuchi, Shigenobu: *See*—
Hashimoto, Shintaro; Morimoto, Masafumi; Nakanishi, Tosaku; Yoshida, Hideo; and Yanagiuchi, Shigenobu, 4,443,856, Cl. 364-513.500.
Yano, Mitsuo; Yoshizawa, Junji; Ishikawa, Kiyofumi; Harada, Nobuo; and Matsumoto, Ikuo, to Banyu Pharmaceutical Co., Ltd. α-Tocopheryl ester of 5-substituted picolinic acid and hypotensive composition containing it. 4,443,459, Cl. 424-266.000.
Yarkoni, Fred E.: *See*—
Cuminale, Raymond J.; Otto, Stanley W.; Knipp, Jerry L.; Seibolt, Bernard P.; and Yarkoni, Fred E., 4,442,942, Cl. 211-163.000.
Yasuda, Zenichi; Morita, Misao; and Nakajima, Takashi, to Nippon Paint Co., Ltd. Measuring device for measuring the amount of change in thickness of the paint layer. 4,443,106, Cl. 356-357.000.
Yasui, Kiyoshi: *See*—
Kondo, Mitsuru; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,443,614, Cl. 548-469.000.
Yates, James A., to Conoco, Inc. Preparation of alcohols from internal olefins. 4,443,638, Cl. 568-882.000.
Yatsuda, Yuji: *See*—
Hagiwara, Takaaki; and Yatsuda, Yuji, 4,443,718, Cl. 307-530.000.
Yatsuo, Tsutomu; and Nagano, Takahiro, to Hitachi, Ltd. Gate turn-off amplified thyristor with non-shorted auxiliary anode. 4,443,810, Cl. 357-38.000.
Yaure, Andrei G.: *See*—
Boev, Vladimir S.; Golev, Sergei P.; Dmitriev, Viktor I.; Pevzner, Efim M.; Yaure, Andrei G.; and Masandilov, Lev B., 4,443,748, Cl. 318-732.000.
Ying, Lincoln, to Celanese Corporation. Sized reinforcing fibers suitable for use in composites of improved impact resistance. 4,443,566, Cl. 523-205.000.
Yokogawa, Kanae: *See*—
Sunahara, Noriyuki; Naruto, Shunsuke; Kagemoto, Akira; Kurooka, Shigeru; and Yokogawa, Kanae, 4,443,365, Cl. 260-112.00R.
Yoneda, Ko: *See*—
Sawada, Takeshi; Yoneda, Ko; Shinmi, Akira; Takagi, Hiroshi; Abiko, Shuzo; and Goto, Hirokazu, 4,443,826, Cl. 360-113.000.
Yoshida, Hideo: *See*—
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Yoshida Kogyo K. K.: *See*—
Matsuda, Nyuzen, 4,442,685, Cl. 66-193.000.
Yoshida, Makoto; Watanabe, Shinichi; and Suzuki, Fuminori, to Citizen Watch Company Limited. Electronic timepiece. 4,443,116, Cl. 368-202.000.
Yoshida, Yoshikazu: *See*—
Sawada, Susumu; Yoshida, Yoshikazu; and Tanaka, Minoru, 4,443,288, Cl. 156-304.600.
Yoshii, Hisao, to Dainichi Kogyo Co., Ltd. Control circuit for a liquid fuel combustion apparatus. 4,443,157, Cl. 417-45.000.
Yoshikawa, Harutoshi: *See*—
Kawamatsu, Yutaka; Saraie, Takahiro; and Yoshikawa, Harutoshi, 4,443,246, Cl. 71-94.000.
Yoshimitsu, Arata: *See*—
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Yoshimura, Masayoshi: *See*—
Imaizumi, Ichiro; Kimura, Masatoshi; Ochi, Shikayuki; Yoshimura, Masayoshi; Yamaguchi, Takashi; and Koda, Toyomasa, 4,443,812, Cl. 357-53.000.
Yoshino, Akira: *See*—
Yamazoe, Katsuhiko; Yoshino, Akira; Kitahama, Yoshiharu; and Iwami, Isamu, 4,443,380, Cl. 260-429.200.
Yoshino Kogyosho Co., Ltd.: *See*—
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, 4,442,944, Cl. 215-1.00C.
Yoshino, Masaki; Oka, Kozo; and Koide, Huminori, to Fuji Xerox Co., Ltd. Electrostatic printing method. 4,443,093, Cl. 355-3.0CH.
Yoshino, Sadazo: *See*—
Hayashida, Shinsaku; Ogata, Seiya; and Yoshino, Sadazo, 4,443,542, Cl. 435-160.000.
Yoshino, Tsunemi: *See*—
Kashihara, Toshitsugu; Yoshino, Tsunemi; Morioka, Akitoshi; and Iwata, Hiroshi, 4,443,087, Cl. 354-401.000.
Yoshino, Yataro; Tsukada, Takami; Saito, Tadao; and Nozawa, Takamitsu, to Yoshino Kogyosho Co., Ltd. Saturated polyester resin bottle and stand. 4,442,944, Cl. 215-1.00C.
Yoshioka, Akiteru: *See*—
Takaya, Takao; Takasugi, Hisashi; Murata, Masayoshi; and Yoshioka, Akiteru, 4,443,444, Cl. 424-246.000.
Yoshioka, Mitsuru; Shoichiro, Uyeo; Hamashima, Yoshio; Kikkawa, Ikuo; Tsuji, Teruji; and Nagata, Wataru, to Shionogi & Co., Ltd. 1-Oxadethiacepham compounds. 4,443,598, Cl. 544-90.000.
Yoshizawa, Junji: *See*—
Yano, Mitsuo; Yoshizawa, Junji; Ishikawa, Kiyofumi; Harada, Nobuo; and Matsumoto, Ikuo, 4,443,459, Cl. 424-266.000.
Yoshizawa, Minoru: *See*—
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Yoshizumi, Toshihiko: *See*—
Koike, Masaru; Hasegawa, Yasumasa; Shimosaka, Satoru; Aoyama, Nagara; and Yoshizumi, Toshihiko, 4,442,876, Cl. 144-2.00R.
Young, Alastair J., to Young, Alastair John. Control means for rotary power transmission. 4,442,727, Cl. 74-336.00R.
Young, Alastair John: *See*—
Young, Alastair J., 4,442,727, Cl. 74-336.00R.
Yun, Chung J., to Crown Cork & Seal Company, Inc. Container actuated counterpressure filling valve. 4,442,873, Cl. 141-39.000.
Zaferes, Constantine J., to Advanced Crystal Sciences, Inc. Apparatus for chemical vapor deposition of films on silicon wafers. 4,443,410, Cl. 422-245.000.
Zahnraderfabrik Renk A.G.: *See*—
Jahnel, Ernst, 4,442,728, Cl. 74-361.000.
Zahnradfabrik Friedrichshafen, AG: *See*—
Elser, Dieter, 4,442,759, Cl. 92-165.0PR.
Merz, Johann, 4,443,169, Cl. 418-171.000.
Zamek, Paul, to Design Controls Corporation. Indexing apparatus for positioning and retaining a disk film. 4,443,100, Cl. 355-76.000.
Zanias, Theodore J., to Masco Corporation. Vent assembly. 4,442,798, Cl. 122-17.000.
Zannella, Albert H.: *See*—
DeSantis, Charles M.; Zannella, Albert H.; Begala, Michael W.; Wills, John R.; and Czerwinski, Watson P., 4,443,803, Cl. 343-749.000.
Zansky, Zoltan: *See*—
Planer, Norman G.; and Zansky, Zoltan, 4,443,719, Cl. 307-570.000.
Zero-Max Industries, Incorporated: *See*—
Altena, Edgar, 4,443,750, Cl. 318-808.000.
Ziegenhain, William C.; and Horton, Gary L., to Conoco Inc. Removal of impurities. 4,443,634, Cl. 568-621.000.
Zierhut, Clarence D., to Clarence Zierhut Incorporated. Portable pocket clothes brush. 4,442,565, Cl. 15-27.000.
Zimmerman, Harry K.: *See*—
Douglas, George H.; Studt, William L.; Dodson, Stuart A.; and Zimmerman, Harry K., 4,443,456, Cl. 424-263.000.
Zingher, Arthur R., to International Business Machines Corporation. Inspection of multilayer ceramic circuit modules by electrical inspection of green specimens. 4,443,278, Cl. 156-64.000.
Zison, Stanley W., to Getty Synthetic Fuels, Inc. Landfill gas recovery method. 4,442,901, Cl. 166-369.000.
Zobl, Hartmut: *See*—
Brautigam, Rolf; Wesemeyer, Jurgen; and Zobl, Hartmut, 4,443,835, Cl. 362-300.000.
Zodrow, Rudolph: *See*—
Kolges, Wilhelm; and Zodrow, Rudolph, 4,443,289, Cl. 156-384.000.
Zublin, Casper W., to Downhole Services, Inc. Hydraulic jet well cleaning assembly using a non-rotating tubing string. 4,442,899, Cl. 166-312.000.
Zwakenberg, Donald R.: *See*—
Donaldson, Donald J.; Kelly, Allan C.; Mulloy, Joseph W.; and Zwakenberg, Donald R., 4,443,416, Cl. 423-122.000.
Zylbert, Thaddeus J.: *See*—
Odermann, Charles R.; and Zylbert, Thaddeus J., 4,442,785, Cl. 112-279.000.
236913 Alberta Ltd.: *See*—
Rayton, Thomas R., 4,442,740, Cl. 83-29.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 17TH DAY OF APRIL, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aspden, David, to Lucas Industries Limited. Electrical switches. Re. 31,557, Cl. 200-314.000.

Beral Enterprises, Inc.: *See*—
Garren, Ralph F.; and Sarver, B., Re. 31,555, Cl. 73-864.110.

Buchanan, Robert R. Kennel, circular facility. Re. 31,556, Cl. 119-19.000.

Carter, Reid F., to Chevron Research Company. Combination flyer-jumper associated with a geophysical data acquisition system and method of manufacture. Re. 31,559, Cl. 367-76.000.

Chevron Research Company: *See*—
Carter, Reid F., Re. 31,559, Cl. 367-76.000.

Devine, Thomas M., Jr., to General Electric Company. Graphite disc assembly for a rotating x-ray anode tube. Re. 31,560, Cl. 378-125.000.

Ford, Ralph E.; and Wright, Kim W., to Slimfold Manufacturing Company, Inc. Pivot and guide rod assembly for bi-fold door. Re. 31,553, Cl. 16-380.000.

Garren, Ralph F.; and Sarver, B., to Beral Enterprises, Inc. Pipette. Re. 31,555, Cl. 73-864.110.

General Electric Company: *See*—
Devine, Thomas M., Jr., Re. 31,560, Cl. 378-125.000.

Giege, Sture; and Lagerqvist, Torgny C. B., to Sandvik Aktiebolag. Roll device. Re. 31,554, Cl. 29-117.000.

Krause, Anthony V.: *See*—
Sinclair, Clive M.; and Krause, Anthony V., Re. 31,558, Cl. 313-422.000.

Lagerqvist, Torgny C. B.: *See*—
Giege, Sture; and Lagerqvist, Torgny C. B., Re. 31,554, Cl. 29-117.000.

Lucas Industries Limited: *See*—
Aspden, David, Re. 31,557, Cl. 200-314.000.

Sandvik Aktiebolag: *See*—
Giege, Sture; and Lagerqvist, Torgny C. B., Re. 31,554, Cl. 29-117.000.

Sarver, B.: *See*—
Garren, Ralph F.; and Sarver, B., Re. 31,555, Cl. 73-864.110.

Sinclair, Clive M.; and Krause, Anthony V. Flat cathode ray tube with repeller electrode and optical magnifying means. Re. 31,558, Cl. 313-422.000.

Slimfold Manufacturing Company, Inc.: *See*—
Ford, Ralph E.; and Wright, Kim W., Re. 31,553, Cl. 16-380.000.

Wright, Kim W.: *See*—
Ford, Ralph E.; and Wright, Kim W., Re. 31,553, Cl. 16-380.000.

LIST OF DESIGN PATENTEES

AB Trama: *See*—
Lohman, Oskar R., 273,445, Cl. D6-92.000.

Ackerman, Arthur M., to Novelty Cord & Tassel Co., Inc. Tie back. 273,452, 4-17-84, Cl. D6-208.200.

Akabane, Moriji, to Hori Glass Co., Ltd. Window pane holder or similar article. 273,459, 4-17-84, Cl. D8-373.000.

American Telecommunications Corp.: *See*—
Perkins, George D., 273,491, Cl. D14-53.000.

Anderson, Gerald R. Tape cartridge holder for an automobile. 273,441, 4-17-84, Cl. D3-35.000.

Andreason, Gustav O.; Friberg, Ulf R.; Kuvaja, Heimo H.; and Qvarnstrom, Bengt G. L., to Stora Kopparbergs Bergslags AB. Seedling flat. 273,482, 4-17-84, Cl. D11-155.000.

Arnolds, Gerd. Faucet set. 273,512, 4-17-84, Cl. D23-25.000.

Arnott, Jerry, to Hanimex Pty. Limited. Camera. 273,498, 4-17-84, Cl. D16-6.000.

Arnott, Jerry, to Hanimex Pty. Limited. Camera. 273,499, 4-17-84, Cl. D16-6.000.

Autotronics, Inc.: *See*—
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CLASS 40

152.1 4,442,617
587 4,442,618

CLASS 42

1 R 4,442,619
90 4,442,620

CLASS 43

26.1 4,442,621
35 4,442,622
54.1 4,442,623
107 4,442,624

CLASS 44

6 4,443,227

CLASS 46

61 4,442,625

CLASS 47

29 4,442,626
56 4,442,627
66 4,442,628
71 4,442,629

CLASS 48

86 R 4,443,228
197 R 4,443,229
4,443,230

CLASS 49

115 4,442,630
199 4,442,631
352 4,442,632
375 4,442,633
493 4,442,634

CLASS 51

56 R 4,442,635
205 WG 4,442,636
288 4,442,637

CLASS 52

36 4,442,638
73 4,442,639
90 4,442,640
94 4,442,641
98 4,442,642
213 4,442,644
219 4,442,643
221 4,442,645
230 4,442,646
393 4,442,647
468 4,442,648
693 4,442,649
694 4,442,650
745 4,442,651

CLASS 53

258 4,442,652
266 R 4,442,653
4,442,654
428 4,442,655
500 4,442,657
552 4,442,656

CLASS 55

3 4,443,231
41 4,443,232
97 4,443,233
126 4,443,234
218 4,443,235
269 4,443,236
379 4,443,237

CLASS 56

11.9 4,442,658
12.7 4,442,659
15.9 4,442,660
16.9 4,442,661
228 4,442,662

CLASS 57

336 4,442,663
339 4,442,664

CLASS 60

39.12 4,442,665
39.281 4,442,667
4,442,668
39.47 4,442,666
251 4,442,669
517 4,442,670
547.1 4,442,671
602 4,442,672
618 4,442,673
632 4,442,674
654 4,442,675
671 4,442,676
673 4,442,677
676 4,442,678

CLASS 62

17 4,443,238
123 4,442,679
217 4,442,680
347 4,442,681
401 4,442,682

CLASS 65

3.11 4,443,239
21.1 4,443,240
29 4,443,241

CLASS 66

64 4,442,683
84 A 4,442,684
193 4,442,685

CLASS 68

198 4,442,686

CLASS 69

1 4,442,687

CLASS 70

252 4,442,688

CLASS 71

11 4,443,242
93 4,443,243
4,443,244
4,443,245
94 4,443,246
4,443,247
98 4,443,248

CLASS 72

41 4,442,689
128 4,442,690
329 4,442,691
349 4,442,692
354 4,442,693
453.01 4,442,694
459 4,442,695

CLASS 73

1 E 4,442,696
12 4,442,697
23 4,442,698
28 4,442,699
32 A 4,442,700
32 R 4,442,701
49.2 4,442,702
49.5 4,442,703
55 4,442,704
83 4,442,705
86 4,442,706
4,442,707
117 4,442,708
146 4,442,709
151 4,442,710
155 4,442,711
462 4,442,712
599 4,442,713
606 4,442,714
626 4,442,715
756 4,442,716
766 4,442,717
4,442,718
861.29 4,442,719
863.31 4,442,720
4,442,721
864.11 Re.31,555
864.18 4,442,722

CLASS 74

5.47 4,442,723
10.41 4,442,724
89.15 4,442,725
117 4,442,726
336 R 4,442,727
361 4,442,728
467 4,442,729
475 4,442,730
571 R 4,442,731
594.5 4,442,732
606 R 4,442,733

CLASS 75

0.5 R 4,443,249
26 4,443,250
42 4,443,251
48 4,443,252
120 4,443,253
123 B 4,443,254
251 4,443,255

CLASS 76

107 A 4,442,734

CLASS 81

3.44 4,442,735
57.15 4,442,736
448 4,442,737
470 4,442,738

CLASS 82

2.5 4,442,739

CLASS 83

29 4,442,740
80 4,442,741
303 4,442,742
372 4,442,743
614 4,442,744

CLASS 84

1.01 4,442,745
4,442,746
4,442,747
4,442,748
1.15 4,442,749
1.18 4,442,750
1.25 4,442,751
484 4,442,752

CLASS 89

46 4,442,753

CLASS 91

1 4,442,754
39 4,442,755

CLASS 92

23 4,442,756
82 4,442,757
138 4,442,758
165 PR 4,442,759

CLASS 98

40 D 4,442,760

CLASS 99

404 4,442,761
427 4,442,762
4,442,763
633 4,442,764

CLASS 100

6 4,442,765
35 4,442,766
116 4,442,767
233 4,442,768

CLASS 101

93.19 4,442,769
93.32 4,442,770
122 4,442,771
127.1 4,442,772
177 4,442,773
226 4,442,774
365 4,442,775

CLASS 102

275.12 4,442,776
444 4,442,777

CLASS 106

1.05 4,443,256
1.23 4,443,257
18.12 4,443,258
38.27 4,443,259
109 4,443,260
4,443,261
209 4,443,262
287.24 4,443,263
292 4,443,264
306 4,443,265

CLASS 108

111 4,442,778
131 4,442,779

CLASS 109

29 4,442,780
53 4,442,781

CLASS 110

225 4,442,782
347 4,442,783

CLASS 112

158 C 4,442,784
279 4,442,785

CLASS 114

255 4,442,786
363 4,442,787

CLASS 118

405 4,442,788
653 4,442,789
657 4,442,790
669 4,442,791

CLASS 119

16 4,442,792
19 Re.31,556
23 4,442,793
115 4,442,794

CLASS 122

4 D 4,442,795
4,442,796
4,442,797
17 4,442,798
250 R 4,442,799
379 4,442,800

CLASS 123

3 4,442,801
25 L 4,442,802
41.69 4,442,803
145 A 4,442,804
198 F 4,442,805
4,442,806
263 4,442,807
279 4,442,808
316 4,442,809
357 4,442,810
376 4,442,811
417 4,442,812
418 4,442,813
425 4,442,814
436 4,442,815
457 4,442,816
489 4,442,817
494 4,442,818
557 4,442,819
571 4,442,820
639 4,442,821
643 4,442,822

CLASS 124

78 4,442,823

CLASS 126

14 4,442,824
68 4,442,825
400 4,442,826
430 4,442,827
451 4,442,828
452 4,442,829

CLASS 127

19 4,443,266
46.2 4,443,267

CLASS 128

6R 4,442,830
4,442,831
71 4,442,832
90 4,442,833
4,442,834
201.27 4,442,835
314 4,442,836
354 4,442,837
369 4,442,838
419 P 4,442,840
419 R 4,442,839
635 4,442,841
660 4,442,842
4,442,843
663 4,442,844
687 4,442,845
784 4,442,846

CLASS 130

27 Z 4,442,847

CLASS 131

108 4,442,848

CLASS 132

37 R 4,442,849

CLASS 133

3 H 4,442,850

CLASS 134

2 4,443,268
12 4,443,269
25.2 4,443,270
34 4,443,271
106 4,442,851
135 4,442,852

CLASS 136

211 4,443,650
249 4,443,651
251 4,443,652
265 4,443,653

CLASS 137

66 4,442,853
82 4,442,854
83 4,442,855
98 4,442,856
117 4,442,857
207 4,442,858
242 4,442,859
557 4,442,860
595 4,442,861
601 4,442,862
614.03 4,442,863
625.27 4,442,864
874 4,442,865

CLASS 138

31 4,442,866
93 4,442,867
118.1 4,442,868

CLASS 139

71 4,442,869
185 4,442,870
435 4,442,871

CLASS 140

92.1 4,442,872

CLASS 141

39 4,442,873
166 4,442,874
348 4,442,875

CLASS 144

2 R 4,442,876
172 4,442,877

CLASS 145

4 4,442,878

CLASS 148

6.15 Z 4,443,273
6.31 4,443,274
12 C 4,443,272
31.55 4,443,275
31.57 4,443,276

CLASS 152

209 R 4,442,879
356 R 4,442,880

CLASS 156

50 4,443,277

64 4,443,278
4,443,494
123 4,443,279
137 4,443,280
140 4,443,281
152 4,443,282
211 4,443,283
212 4,443,284
215 4,443,285
245 4,443,286
247 4,443,287
304.6 4,443,288
384 4,443,289
396 4,443,290
504 4,443,291
634 4,443,292
647 4,443,293
656 4,443,294
657 4,443,295

CLASS 160

25 4,442,881

CLASS 162

52 4,443,296
101 4,443,297
252 4,443,298
264 4,443,299
306 4,443,300

CLASS 164

187 4,442,882
448 4,442,883
456 4,442,884

CLASS 165

25 4,442,885
76 4,442,886
85 4,442,887
104.16 4,442,888
109 R 4,442,889
124 4,442,890

CLASS 166

55.2 4,442,891
85 4,442,892
117.5 4,442,893
156 4,442,894
250 4,442,895
278 4,442,896
280 4,442,897
303 4,442,898
312 4,442,899
342 4,442,900
369 4,442,901
374 4,442,902
385 4,442,903

CLASS 173

28 4,442,904
36 4,442,905
48 4,442,906
164 4,442,907

CLASS 174

48 4,443,654
52 PE 4,443,655
4,443,656
110 FC 4,443,657
113 C 4,443,658
140 C 4,443,659

CLASS 175

74 4,442,908
329 4,442,909

CLASS 177

25 4,442,910
165 4,442,911

CLASS 178

22.04 4,443,660

CLASS 179

2 C 4,443,662
2 EB 4,443,661
5.5 4,443,664
18 ES 4,443,663
99 H 4,443,665
111 E 4,443,666
115 R 4,443,667
156 A 4,443,668
175.2 C 4,443,669

CLASS 180

89.15 4,442,912
190 4,442,913
255 4,442,914
271 4,442,915

CLASS 181

120 4,442,916
135 4,442,917

CLASS 182

10 4,442,918
63 4,442,919
199 4,442,920

CLASS 187

8.52 4,442,921
9 E 4,442,922

CLASS 188

79.5 GT 4,442,924
79.5 K 4,442,923
282 4,442,925
317 4,442,926

CLASS 190

18 A 4,442,927

CLASS 192

3 N 4,442,928
52 4,442,929
85 AB 4,442,930
4,442,931

CLASS 198

344 4,442,934
366 4,442,932
502 4,442,933
648 4,442,935

CLASS 200

11 DA 4,443,670
81 R 4,443,671
144 AP 4,443,674
144 B 4,443,672
144 R 4,443,673
223 4,442,936
243 4,443,675
304 4,443,676
314 Re.31,557

CLASS 204

1 T 4,443,301
2 4,443,302
15 4,443,303
27 4,443,304
59 M 4,443,305
64 T 4,443,306
98 4,443,307
103 4,443,308
149 4,443,309
158 R 4,443,310
4,443,311
181 R 4,443,312
240 4,443,313
243 R 4,443,314
253 4,443,315
263 4,443,316
290 F 4,443,317
298 4,443,318
299 R 4,443,319
302 4,443,320

CLASS 206

315.4 4,442,937
329 4,442,938
345 4,442,939
425 4,442,940
540 4,442,941

CLASS 208

8 LE 4,443,321
11 LE 4,443,322
4,443,323
22 4,443,324
55 4,443,325
64 4,443,326
97 4,443,327
106 4,443,328
111 4,443,329
112 4,443,330

CLASS 209

211 4,443,331
331 4,443,332

CLASS 210

87 4,443,333
168 4,443,334
220 4,443,335
238 4,443,336
602 4,443,337
629 4,443,338
635 4,443,339
697 4,443,340
702 4,443,341
759 4,443,342
768 4,443,343
774 4,443,344
782 4,443,345
785 4,443,346

CLASS 211

163 4,442,942

CLASS 212

192 4,442,943

CLASS 215

1 C 4,442,944
218 4,442,945
230 4,442,946
344 4,442,947

CLASS 219

8.5 4,443,677
10.41 4,443,678
10.49 R 4,443,679
69 C 4,443,680
4,443,681
4,443,682
74 4,443,683
121 LH 4,443,684
4,443,685
123 4,443,686
130.21 4,443,687
222 4,443,688
469 4,443,689
506 4,443,690
522 4,443,691

CLASS 220

90.2 4,442,948
257 4,442,949
269 4,442,950
319 4,442,951
354 4,442,952

CLASS 222

14 4,442,953
55 4,442,954
153 4,442,955
185 4,442,956
207 4,442,957
213 4,442,958
402.24 4,442,959

CLASS 224

32 A 4,442,960
42.03 B 4,442,961
255 4,442,962

CLASS 226

97 4,442,963

CLASS 227

8 4,442,964
136 4,442,965

CLASS 228

123 4,442,966
159 4,442,967
231 4,442,968

CLASS 229

2.5 R 4,442,969
17 G 4,442,970
43 4,442,971

CLASS 235

379 4,443,692
458 4,443,693
465 4,443,694

CLASS 236

1 EA 4,442,972

CLASS 238

349 4,442,973

CLASS 239

1 4,442,974
150 4,442,975
183 4,442,976
332 4,442,977
453 4,442,978
656 4,442,979

CLASS 241

34 4,442,980

CLASS 242

7.19 4,442,981
55 4,442,982
84.51 R 4,442,983
106 4,442,984
186 4,442,985

CLASS 244

12.1 4,442,986
110 B 4,442,987

CLASS 246

34 CT 4,442,988

CLASS 248

49 4,442,989
62 4,442,990
146 4,442,991
243 4,442,992
327 4,442,993
547 4,442,994

CLASS 249

139 4,442,995

CLASS 250

205 4,443,695
4,443,696
223 R 4,443,697
227 4,443,698
4,443,699
4,443,700
332 4,443,701
357.1 4,443,702
491.1 4,443,703
4,443,704
558 4,443,705
4,443,706

CLASS 251

77 4,442,996
129 4,442,997
4,442,998
358 4,442,999

CLASS 252

8.55 R 4,443,347
37.2 4,443,348
46.7 4,443,360
49.9 4,443,349
62.54 4,443,350
75 4,443,351
94 4,443,352
103 4,443,353
174.12 4,443,355
190 4,443,354
301.17 4,443,356
321 4,443,357
353 4,443,358
358 4,443,359
516 4,443,361
545 4,443,362
547 4,443,363
4,443,364

CLASS 254

89 R 4,443,000
93 R 4,443,001

CLASS 256

59 4,443,002

CLASS 260

112 R 4,443,365
4,443,366
112.5 LH 4,443,368
112.5 R 4,443,367
131 4,443,369
145 B 4,443,370
169 4,443,371
239 A 4,443,372
245.2 R 4,443,373
245.4 4,443,374
245.6 4,443,375
397.4 4,443,377
403 4,443,378
427 4,443,379
429.2 4,443,380
439 R 4,443,381
448 R 4,443,382
453 RZ 4,443,376
465.2 4,443,383
982 4,442,384

CLASS 261

18 A 4,443,385
29 4,443,386
30 4,443,387
39 A 4,443,388
153 4,443,389

CLASS 264

13 4,443,390
22 4,443,391
25 4,443,392
53 4,443,393
65 4,443,394
117 4,443,395
136 4,443,396
171 4,443,397
235 4,443,398
519 4,443,399
4,443,400
544 4,443,401

CLASS 266

48 4,443,003
226 4,443,004

CLASS 269

328 4,443,005

CLASS 271

10 4,443,006
269 4,443,007

CLASS 272

73 4,443,008
104 4,443,009

CLASS 273

242 4,443,010
247 4,443,011
292 4,443,012
318 4,443,013
363 4,443,014

CLASS 277

30 4,443,015
73 4,443,016
152 4,443,017
189 4,443,018
227 4,443,019

CLASS 279

1 DA 4,443,020
4 4,443,021

CLASS 280

11.28 4,443,022
278 4,443,023
304 4,443,024
407 4,443,025
714 4,443,026

CLASS 283

83 4,443,027

CLASS 285

38 4,443,028
93 4,443,029
263 4,443,030
419 4,443,031

CLASS 290

4 R 4,443,707
53 4,443,708

CLASS 292

202 4,443,032
235 4,443,033

CLASS 296

65 R 4,443,034
190 4,443,035

CLASS 299

2 4,443,036
4,443,037
81 4,443,038

CLASS 301

64 SD 4,443,039

CLASS 303

50 4,443,040

CLASS 305

43 4,443,041

CLASS 307

41 4,443,709
80 4,443,710
140 4,443,712
260 4,443,713
269 4,443,714
270 4,443,715
309 4,443,716
362 4,443,717
400 4,443,711
530 4,443,718
570 4,443,719
578 4,443,720

CLASS 308

6 C 4,443,042
10 4,443,043
223 4,443,045

CLASS 310

14 4,443,721
45 4,443,722
53 4,443,723
171 4,443,724
214 4,443,725
248 4,443,726
261 4,443,727
312 4,443,728
330 4,443,729
4,443,730
334 4,443,731
343 4,443,732
369 4,443,733

CLASS 312

183 4,443,046

CLASS 313

26 4,443,734
345 4,443,735
414 4,443,736
422 Re.31,558
431 4,443,737
491 4,443,738

CLASS 315

244 4,443,739
284 4,443,740
307 4,443,741

CLASS 318

85 4,443,742
115 4,443,743
269 4,443,744
461 4,443,745
696 4,443,746
723 4,443,747
732 4,443,748
774 4,443,749
808 4,443,750

CLASS 320

2 4,443,751
22 4,443,752

CLASS 323

313 4,443,753

CLASS 324

61 R 4,443,754
66 4,443,755
73 PC 4,443,756
77 B 4,443,757
113 4,443,758
216 4,443,759
309 4,443,760
311 4,443,761
346 4,443,762
439 4,443,763
456 4,443,764

CLASS 328

55 4,443,765
151 4,443,766
155 4,443,767
167 4,443,768

CLASS 329

50 4,443,769

CLASS 330

284 4,443,770
297 4,443,771

CLASS 333

28 R 4,443,772
104 4,443,773
165 4,443,774

CLASS 335

281 4,443,775
302 4,443,776

CLASS 336

65 4,443,777
90 4,443,778
92 4,443,779

CLASS 337

257 4,443,780

CLASS 338

34 4,443,781
195 4,443,782

CLASS 339

26 4,443,047
63 M 4,443,048
75 MP 4,443,049
99 R 4,443,050
107 4,443,051
113 R 4,443,052
221 R 4,443,053
273 R 4,443,054

CLASS 340

32 4,443,783
52 F 4,443,784
58 4,443,785
310 R 4,443,786
347 P 4,443,787
4,443,788
365 R 4,443,789
539 4,443,790
612 4,443,792
634 4,443,791
4,443,793
748 4,443,794
870.31 4,443,795

CLASS 343

5 PD 4,443,796
5 SC 4,443,797
17.2 PC 4,443,799
372 4,443,800
442 4,443,801
729 4,443,802
749 4,443,803
786 4,443,804
803 4,443,805

CLASS 346

135.1 4,443,806
140 R 4,443,807

CLASS 350

6.5 4,443,055
98 4,443,056
281 4,443,057
294 4,443,058
310 4,443,059
317 4,443,060
318 4,443,061
332 4,443,062
334 4,443,063

4,443,064
335 4,443,065
358 4,443,066
422 4,443,067
423 4,443,068
464 4,443,070
469 4,443,069
546 4,443,071
584 4,443,072

CLASS 351

98 4,443,073
178 4,443,074
209 4,443,075

CLASS 353

101 4,443,076

CLASS 354

21 4,443,077
145.1 4,443,082
152 4,443,083
173.11 4,443,084
200 4,443,088
214 4,443,089
289.12 4,443,090
401 4,443,087
402 4,443,085
403 4,443,078
407 4,443,079
409 4,443,086
432 4,443,080
479 4,443,081

CLASS 355

3 CH 4,443,093
3 DD 4,443,102
3 R 4,443,092
3 SH 4,443,094
3 TR 4,443,091
14 R 4,443,095
14 SH 4,443,101
53 4,443,096
68 4,443,097
74 4,443,098
75 4,443,099
76 4,443,100

CLASS 356

152 4,443,103
246 4,443,104
312 4,443,105
357 4,443,106
373 4,443,107
418 4,443,108

CLASS 357

15 4,443,808
16 4,443,809
38 4,443,810
42 4,443,811
53 4,443,812

CLASS 358

44 4,443,813
60 4,443,814
114 4,443,815
160 4,443,816
167 4,443,817
213 4,443,818
236 4,443,819
296 4,443,820
326 4,443,821

CLASS 360

67 4,443,822
77 4,443,823
104 4,443,824
4,443,825
113 4,443,826
132 4,443,827

CLASS 361

93 4,443,828
275 4,443,829
4,443,830

CLASS 362

80 4,443,831
84 4,443,832
189 4,443,833
280 4,443,834
300 4,443,835
375 4,443,836
396 4,443,837

CLASS 363

19 4,443,838
20 4,443,839
24 4,443,840
41 4,443,841
4,443,842
59 4,443,843
132 4,443,844

CLASS 364

200 4,443,845
4,443,846
4,443,847
4,443,848
4,443,849
4,443,850
415 4,443,851
431.03 4,443,852
434 4,443,853
483 4,443,854
513 4,443,855
513.5 4,443,856
4,443,857
518 4,443,858
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270 4,443,403

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91 4,443,167
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102 4,443,525
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270 4,443,532
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521 4,443,620

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	248	273,435
		273,436
	309	273,437
		273,438
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	400	273,440
D3—	35	273,441
	40	273,442
D4—	23.1	273,443
D6—	70	273,444
	92	273,445
	113	273,446
	116	273,447
	177	273,448
	188	273,449
		273,450
	197	273,451
	208.2	273,452
D7—	311	273,495
	398	273,453
D8—	28	273,454
	52	273,455
	65	273,456
	330	273,457
	356	273,458
	373	273,459
	387	273,460
D9—	355	273,461
	431	273,462
	443	273,463
D10—	6	273,464
	46	273,465
	50	273,466
	64	273,467
	73	273,468
		273,469
	121	273,470
	125	273,471
D11—	75	273,472
	86	273,473
	100	273,474
		273,475
	105	273,476
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		273,478
		273,479
		273,480
	139	273,481
	155	273,482
	162	273,483
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	159	273,485
	162	273,486
D13—	12	273,487
		273,488
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D15—	9	273,493
	30	273,494
	132	273,496
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		273,499
D17—	18	273,500
D18—	1	273,501
	7	273,502
D21—	121	273,503
	204	273,504
		273,505
		273,506
	212	273,507
	252	273,508
D22—	27	273,509
D23—	2	273,510
	14	273,511
	25	273,512
D24—	26	273,513
	29	273,514
	46	273,515
	64	273,516
	99	273,517
D25—	52	273,518
D26—	48	273,519
D28—	18	273,520
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DESIGN PATENTS

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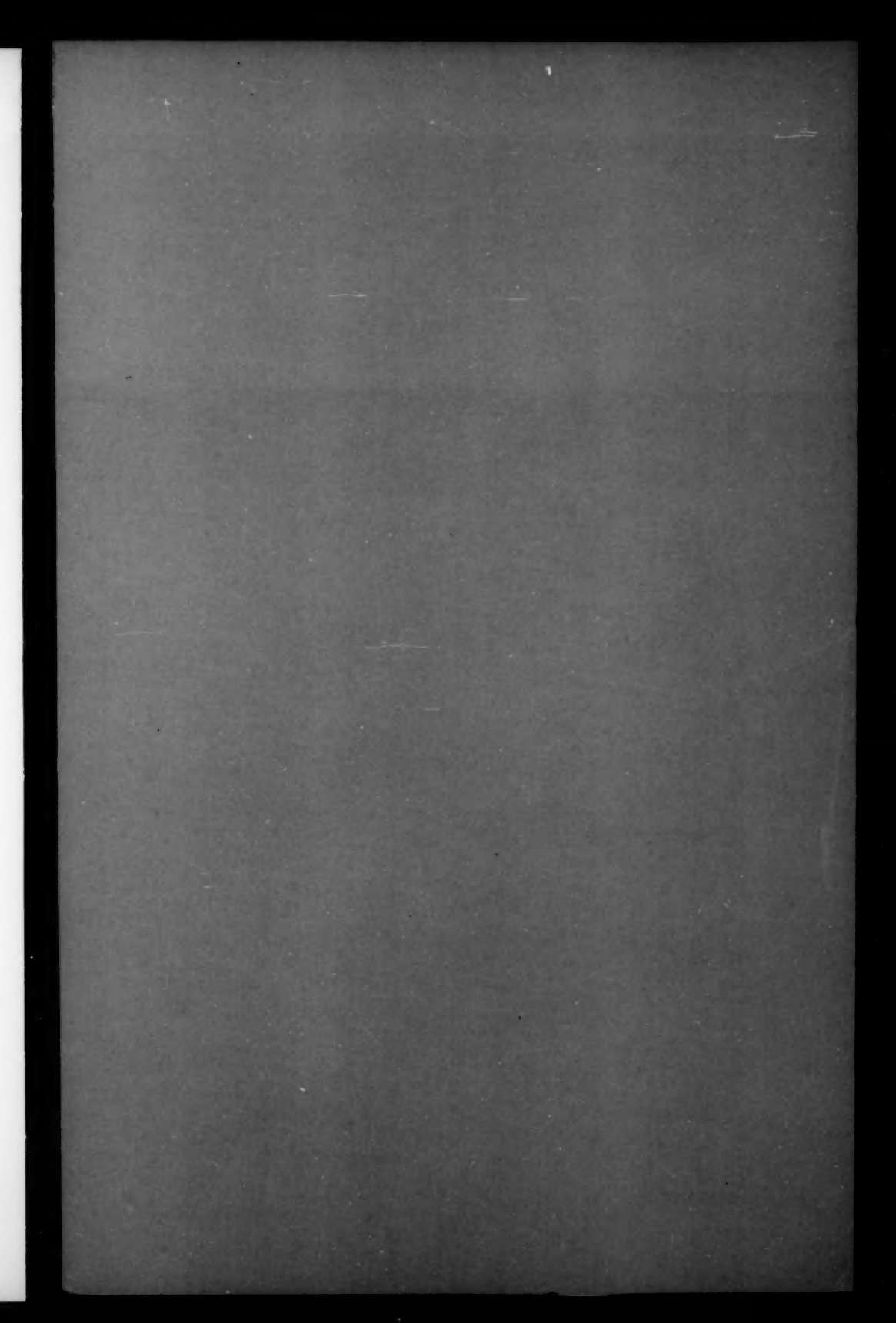
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